2-23

Saturday Review

75¢

August 9, 1975

# INSIDE THE BRAIN
## The Last Great Frontier



## Democracy Is Not Dead in India
### by Indira Gandhi

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See page 58 for complete rules or write:

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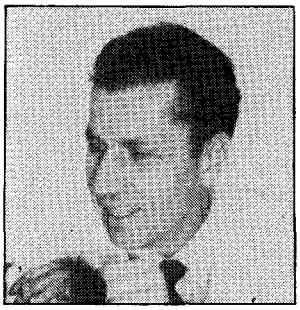
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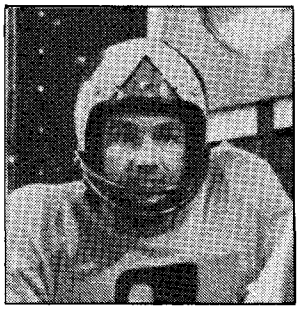
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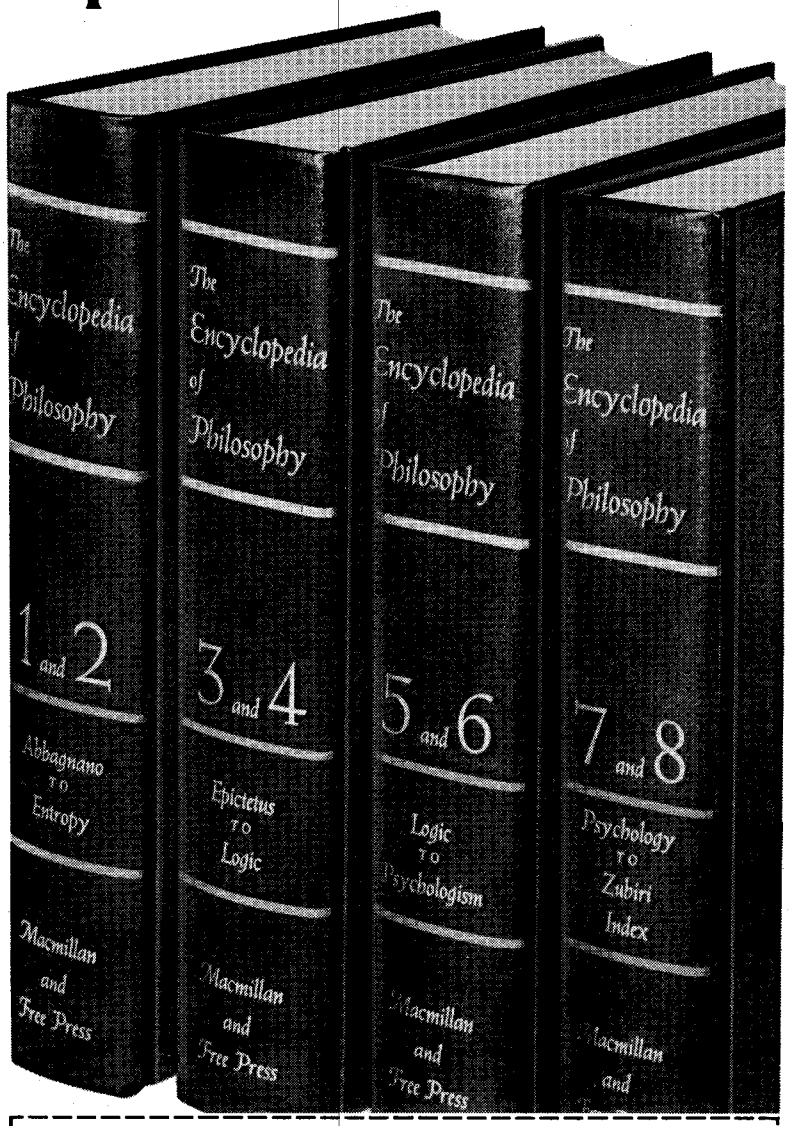


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# American Traditions and Secret Police

America's fast-approaching Bicentennial Year furnishes a useful backdrop for the widening debate over the CIA. The main issues growing out of an American undercover organization were anticipated by the handful of young men who were later to be called "America's Founding Fathers."

Both in their arguments against Great Britain in the struggle for independence and in their exploration of ideas at the Philadelphia Constitutional Convention, the young founders rejected the notion that there could be any justification for interfering in the internal affairs of other countries. When the American Revolutionary leaders told Great Britain to respect our right to self-determination, they thereby fixed our own obligation to respect that same right for others. They would have found ludicrous and absurd the argument used in 1947 to justify the creation of the CIA; namely, that the United States could deal with Soviet intrigue in the world only by playing the same international game. That game eventually involved the use of secret U.S. agents for manipulating or subverting or overthrowing the policies and institutions of other countries.

It is a mistake to say that no one can possibly know how leaders of the American independence movement and the U.S. Constitutional Convention would react to current situations. They made known their full views on almost every question involving the issues of power. Their field of expertise was the interaction of politics and history. It is doubtful whether, before or since, any group of men articulated more thoroughly the lessons of historical experience, especially as they pertain to the abuses of authority. The leaders of the Philadelphia Convention were conscious of the propensity of nations to subvert or undermine one another. They realized that competition among nations can become as irrational as it is predatory, and that men in government all too readily set aside moral codes in order to serve a national advantage.

One need not speculate, therefore, on the attitude of the American founders toward the National Security Act of 1947 creating an agency to deal in undercover activities—an agency that eventually was to fight and finance wars without authorization by Congress, and that was to engage in political assassination. The main point the founders would have made here is that leaders of any government would have to be naive indeed to believe they could engage in such outrages without precipitating retaliatory action.

Let us suppose that the American people in 1947 had some way of knowing all the things that would happen as the result of the establishment of the CIA. Suppose they knew in advance that the CIA, operating abroad with billions of dollars, would be charged ultimately with indirect involvement in the assassination of an American President; or that it would figure prominently in undeclared wars in Vietnam, Laos, and Cambodia with a toll of 55,000 American lives and 30 times as many Indo-Chinese lives; or that it would spy on Americans and violate their constitutional rights. Obviously, if the American people in 1947 knew all this might happen, they would have split the sky with their wrath.

The American Founding Fathers would not have been surprised at the train of events that followed the creation of the CIA. They would have thought it childish of U.S. government leaders not to expect such an agency would become a secret police or that its activities could be kept at a distance. As for the argument that our secret agents were justified in trying to assassinate Castro because he was a dictator, the Founding Fathers would have pointed out that this line of thought and action tends to lead to dictatorship at home.

They would have been appalled at the original secret decision of the United States to block the first nationwide free election in Vietnam, as required under the Geneva Treaty of 1954, because the results might not be to our liking. And they would have been amazed that the American leaders who made this decision should have broken so drastically with their own early history and with the ideas that went into the founding of their own country.

As for the argument that because the Soviet Union engages in venal undertakings we have no choice except to employ the same methods, the American founders would have pointed out what would have seemed to them to be painfully obvious: imitation of the enemy is the easiest way to make him the victor. They would have said, against the background of their own wide study of history, that the requirements of a free society are absolute and do not lend themselves to convenient manipulation or trimming—even in the name of national advantage or national security.

After 200 years of independence, the time has come not for super-celebrations and spectacular fireworks but for a refresher course in what this government was designed to be, and what must be done to preserve it. N.C.



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# Letters From Readers

**Radio Makes No Waves**

In his article ("The Intellectual in Videoland," May 31) Douglass Cater quoted Mr. Marconi describing telecommunications as the "almost unnoticed working equipment of civilization." So unnoticed that Mr. Cater didn't check with the Electronic Industries Association, where he would have found out that people spend more money for new radios than they do for new television sets; that radio listening time leads television watching time 13 hours out of the 18 hours from 6:00 A.M. until midnight; that the average American home has 5.1 radio sets; that of the $4.5 billion Mr. Cater attributed to "broadcasting revenue," $1.9 billion of that was for radio.

Radio is so ubiquitous that we don't even notice it. . . .

Jay Smith
Houston, Mo.

**Tenure Debated**

The reference to Bloomfield College in Fred Hechinger's article ("Loss of Tenure: Return of a Nightmare," May 31) did not convey a fully accurate understanding of the college's situation.

In June 1973, responding to lowering enrollments and an imminent financial crisis, the college adopted a plan for reducing the size of the faculty from 72 to 54 full-time positions under the general AAUP guidelines for planning in financial exigency. The plan adopted by the board of Bloomfield College had followed months of careful, although controversial, planning by the faculty itself. . . .

A month after the board's action, the AAUP was certified as the sole collective bargaining agent for the faculty, thus frustrating any attempt on the part of the board and the faculty to work out a contract program with an alternative to the traditional tenure system. The AAUP then initiated litigation, charging that the board had abrogated its tenure contract with the faculty and further charging that the college was, indeed, not facing any financial exigency. On June 28, 1974, Judge Antell rendered his decision, supporting the plaintiffs' position that the college was not facing a bona fide financial exigency. On August 5, 1974, the college filed for Chapter XI reorganization under the Federal Bankruptcy Act. . . . The court soon thereafter appointed a receiver, who . . . notified 13 faculty members (many of whom were the same faculty whose tenure had been terminated by the June 1973 board action) that their services would not be required. . . .

Throughout the entire period of controversy and litigation, no formal charge was ever made that the administration or board violated any individual's or group's academic freedom. Fred Hechinger's conclusion is perfectly right—it is better to reform tenure than to bury it. . . .

Merle F. Allshouse
President, Bloomfield College
Bloomfield, N.J.

Fred Hechinger's article quotes me accurately, though in a context that suggests a position I do not hold and never have held. More seriously, the article erroneously reports that at Union College "tenure had been replaced with a system of renewable contracts." In June 1974, when I left Union, about one-half the faculty was tenured. At my urging, the trustees had earlier set a tenure maximum of 60 percent, and a campus committee had subsequently developed an equitable allocation plan for each year's appointment decisions. For two years before I left, renewable contracts were offered to, and accepted by, a few teachers whom the college very much wished to keep, but for whom it did not have at the time an open "tenure slot. . . ."

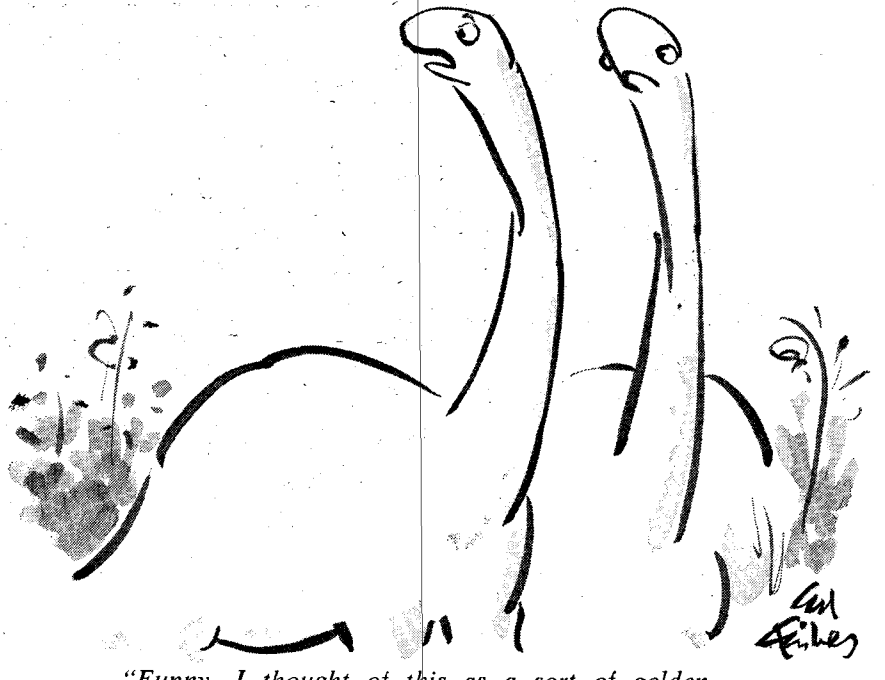
But it should be made clear that Union retains a tenure base and has never seriously questioned its value, either to faculty or to institutions.

Harold C. Martin
President, American
Academy in Rome
New York, N.Y.

It seems to me that Fred Hechinger has missed the main point of what has happened to the tenure system. It may possibly protect academic freedom as well as job security for the old, but as it now works it deprives the young of both. . . .

To an increasing extent, undergraduate teaching is done by teaching assistants and non-tenured instructors. It is obviously to the advantage of a university hard pressed financially to turn these out every five or six years and replace them with beginners at beginners' salaries. This means that a substantial part of the horrifying cost of a college education now goes to subsidize the publications of tenured non-teaching faculty.

What the AAUP has done so far has tended to increase the evils of the system. Its "victory" at Bloomfield College forced the college into bankruptcy. . . .



*"Funny, I thought of this as a sort of golden, aquarian age. It doesn't look carboniferous to me!"*



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The solution in my opinion is not to abolish tenure for those who already hold it but to stop granting it. . . . As the currently tenured professors die, retire, or move on to better jobs, they can thus be replaced by younger colleagues on term appointments—younger colleagues with some incentive to teach well.

If the AAUP is losing younger members to the teachers' unions, we should give serious thought to the reasons.

Anna Mary Wells
New Brunswick, N.J.

My experiences as a Ph.D candidate and half-time faculty person at a large public university left me with the distinct opinion that tenure serves only to stifle those who are truly eager for academic freedom and for healthy changes within the university system. As a teaching fellow, I spent three years learning the tricks of survival in a world where only ranking, tenured professors were real persons with real rights.

Faculty meetings often amounted to verbal sparring matches concerned with petty issues that mattered only to those professors in power within the department. New faculty were often totally excluded from voting on important issues, even though they were affected by the outcomes of the faculty vote. Pressure was put on us "non-persons" to attend these meetings—or supply a very plausible excuse for our absence. . . .

My question is this: whose freedom is protected by tenure? The freedom of the new faculty goes unprotected, for they must court the ranks of the tenured professors even to stay employed. And the freedom of teachers and students to discuss issues in the classroom is hardly supported by tenure, for many tenured professors avoid the classroom teaching situation entirely.

In short, the university system must be responsible for educating its students and its patrons in such a manner that free and open debate may exist without threats to either faculty or students. That is a heavy task, but ideally it is the ultimate task of the university. Certainly, it is a task that cannot be accomplished when the university system is controlled by a group of privileged, protected, often outmoded professors who exist primarily for the furtherance of their own vested interests.

Charlen S. Mitchell
Nashville, Tenn.

The current re-evaluation of faculty tenure should involve two issues in addition to those discussed by Fred Hechinger.

First, whether or not a college's faculty is 50, 75, or 100 percent tenured may be of less importance than the number of faculty tenured in each academic department. Students' preferences for courses may change because of shifts in academic interests, vocational goals, or employment opportunities. "Demonstrably bona fide financial emergency" becomes very difficult to prove as the basis for terminating a faculty member in an over-staffed, fully tenured department, especially if the institution's budget is in the black. Because the "due process" involved is "too troublesome, time-consuming, and disruptive," administrations will continue the misallocation of faculty resources until retirements occur.

Second, Mr. Hechinger cited the rationale for tenure offered by Kingman Brewster, Jr.: a partial hedge against the "very high risk" of "long-term intellectual investment" required to push "forward the frontiers of learning." This may be applicable to institutions where significant research is the prime criterion for tenure. Such reasoning, however, may be less relevant for colleges that evaluate a faculty member primarily on classroom teaching capability.

John S. McConnell
Albion, Mich.

*Saturday Review* is to be congratulated for its service to the profession of education: Fred Hechinger's article was timely and cogent, though incomplete.

Tenure, of course, is a concept that applies to educational professionals at all levels, and we believe it is instructive to observe the threats to tenure experienced by primary and secondary teachers as an indication of what higher education faculty will face in the not so distant future. . . .

The NEA, AFT, and AAUP are unions that have gone the way of all unions in being more concerned about their own organizational security than about personal freedom. As a result, through permissive or mandatory legislation in some states, educators are being told they must join and/or pay dues to the teachers union if they want to continue teaching. In Michigan a number of teachers have been fired after long and honorable service for exercising their constitutionally protected right not to be coerced into associating with a private organization. . . .

While teachers in some states are specifically protected in their right to refrain from joining, assisting, or supporting unwanted labor organizations, your readers should be aware that teacher unions have budgeted literally millions of dollars to accomplish by legislative enactment what they have been unable to accomplish through the free interchange of ideas. . . .

What then of tenure? Indeed, what then of professional independence if a union can subject a teacher to its authority on all manner of unrelated issues with job security as an implicit threat? . . .

Susan E. Staub
National Right to Work Committee
Washington, D.C.

*"To my nephew, Leroy Chitteden, who didn't know enough to come in out of the rain, I leave my umbrella."*



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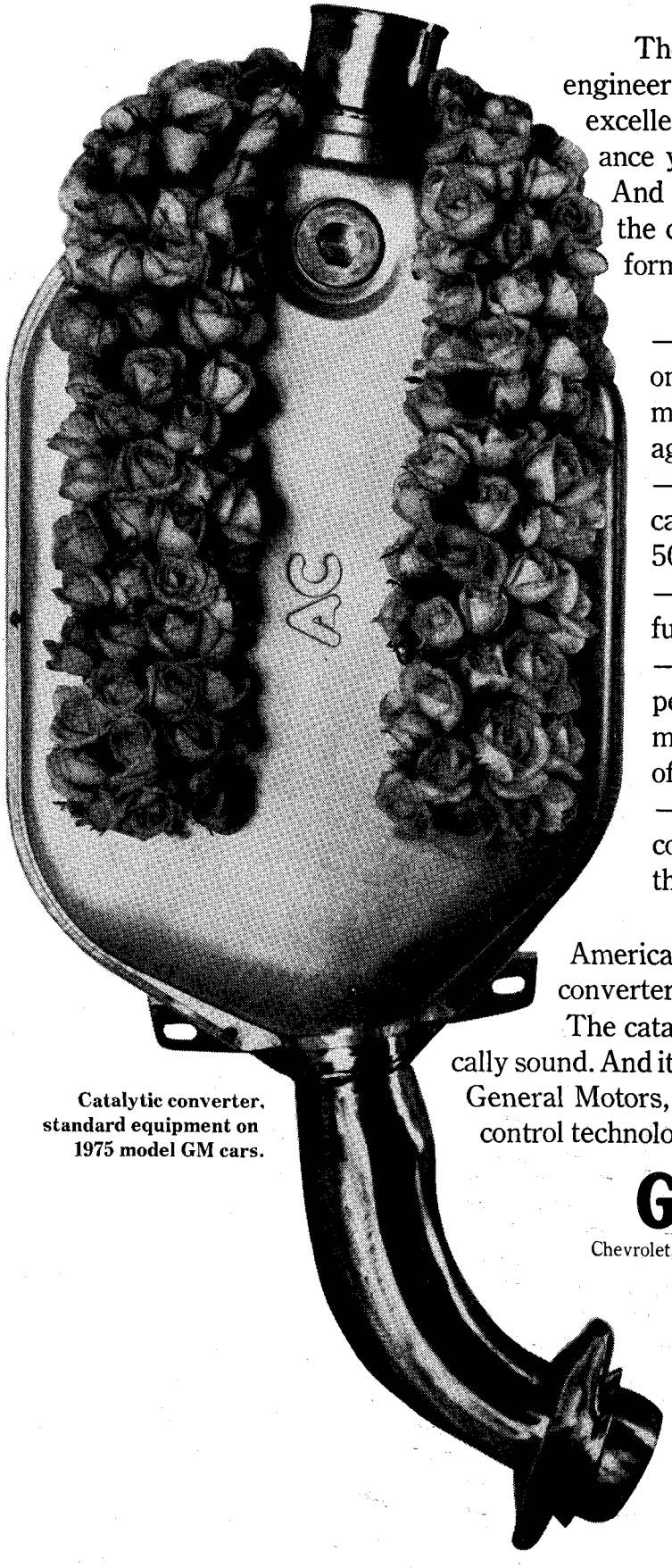

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# World Progress Report

### Cleaning Up

Thanks to recent landmark legislation, including the National Environmental Policy Act (1969), the Clean Air Act (1970), and the Water Pollution Control Act (1972), individual citizens and local community groups have a vital role in seeing to it that industry minds its ecological manners. Laws or no laws, however, most citizens are unprepared with any practical understanding of the causes and effects of pollution and what can be done about them; so their new power proves mostly illusory.

As a tool for concerned laymen who want to participate knowledgeably in decisions about industrial pollution, a public-interest research group called INFORM, headquartered at 25 Broad Street in New York City, has published an invaluable primer called *A Clear View*. Subtitled "A Guide to Industrial Pollution Control," the book leads the lay reader step-by-step from the identification and assessment of the various kinds of pollution associated with specific industrial processes, through the alternative methods and relative costs of cleaning up. In the process *A Clear View* gives explicit directions to many obscure but invaluable sources of data buried out of public view in government reports, trade publications and directories, and corporate documents.

The INFORM guide goes on to suggest how citizens can develop their own proposals for pollution control with due respect for economic, political, and technological constraints. Finally, the book offers concrete advice concerning the effective presentation of citizen proposals to an offending corporation or, if that fails, to the courts, the legislature, regulatory agencies, the press, and other powerful institutions.

According to Joanna Underwood, director of INFORM, any citizen who is armed with serious motivation, a passing acquaintance with ninth-grade math, and access to an adding machine will find in the guide the tools necessary for working with industry and government specialists "on a very sophisticated level." Insists *A Clear View*'s author, James S. Cannon, "factory pollution control is not an esoteric science that has to be left to the experts."

### No Smoking

Scandinavian governments are taking positive new steps against the tobacco habit. Specialists at last June's third World Conference on Smoking and Health, sponsored by the American Cancer Society and the National Cancer Institute, heard a report of a new Norwegian law that bans all advertising of tobacco products while requiring health warnings on all tobacco packaging. The law also prohibits the sale of tobacco to minors under 16 years of age and empowers the government to set safety-related standards for tobacco products.

In the most radical approach yet to the tobacco menace, Sweden has set for itself the goal of becoming a nation of non-smokers, beginning with the children born this year. Although the current annual rate of cigarette consumption in Sweden is only about one-third of the 4,000-plus per-capita U.S. adult average, the Swedish rate has been rising steadily during the past three generations, especially among women and young people.

The Swedish program will stress how important it is for the child to grow up in a smoke-free environment. Even before birth, a speaker at the Smoking and Health meeting testified, a child exposed to smoke through its mother's system is deprived of essential oxygen in the womb, suffers depressed respiratory functioning, and incurs a greatly increased risk of dying before birth or immediately after.

The details of Sweden's national effort, still to be legislated, are expected to include restrictions or outright prohibitions on cigarette advertising. In order to discourage consumption, the price of cigarettes, already $1.50 per pack, may be raised further by heavy taxes. A ban on smoking in public places may also be part of the campaign. Most important, however, will be an intensive educational program aimed at dissuading children from ever taking up the smoking habit and helping confirmed butt-fiends, especially pregnant women, to give it up.

*"Can I have him call you back? He's wrestling with an idea whose time has come."*

### Health Food

Nutrition-conscious eaters weary of beginning the day with factory-processed orange juice may find their appetite reawakened by a new beverage from Japan. A team of sober scientists at the Shizuoka Prefecture Industrial Experiment Station has developed a technique for transmuting the elixir of mandarin oranges into wine.

For the prefecture, a major orange grower, the process promises to take up the slack when bumper harvests depress market prices. The recipe calls for pasteurized fresh orange juice to be fermented for two weeks with glucose and pure yeast at a temperature of 15 degrees centigrade and then aged for two years before it is served.

ANTHONY WOLFF



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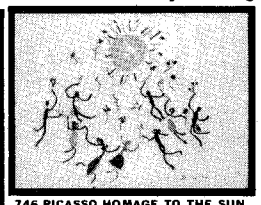

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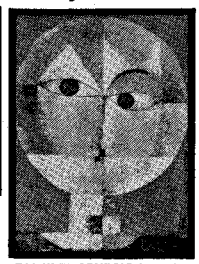

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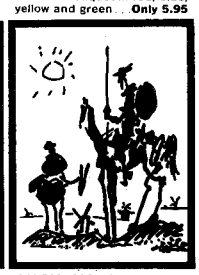

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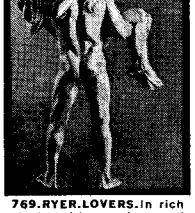

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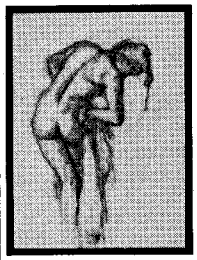

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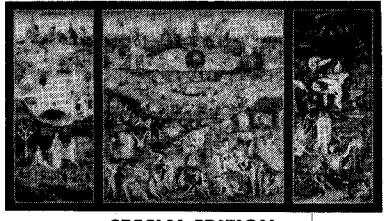

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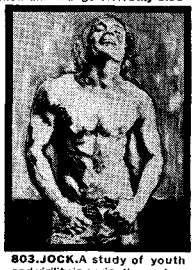

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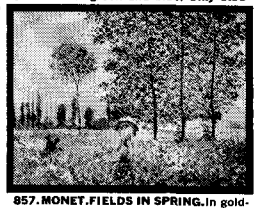

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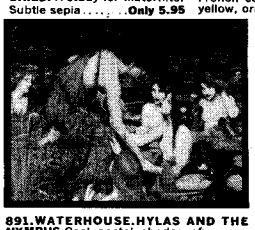

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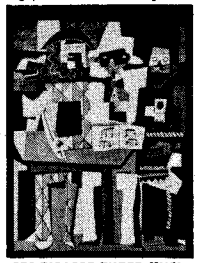

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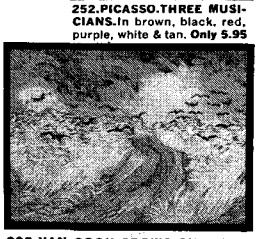

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**"Those who know me would find it ludicrous to believe that I would want to be known in history as the person who defeated the most cherished hopes of Jawaharlal Nehru for the Indian people."**

# Prime Minister Indira Gandhi Responds to Charges That Democracy in India Is Dead

Editor's Note: *For the past month, India has been rocked by a series of political arrests and repressions. These extraordinary measures stunned many millions of people throughout the world who, though mindful of chaotic conditions in India, nonetheless could not reconcile Prime Minister Indira Gandhi's actions with the traditions of a democratic society. The editors of the* Saturday Review *cabled a series of questions to Mrs. Gandhi about the meaning of the new events. The questions and her cabled reply follow.*

*Mrs. Gandhi, what is the most effective answer your friends in the United States could give to those critics who feel your action has threatened democratic government in India?*

**Mrs. Gandhi:** The question is simple: was it democracy for a vociferous minority, which has the support of big money, big press—and, some say, influential interests abroad—to force its views on the majority and seek to overthrow a legally constituted government by unconstitutionally defying laws and inciting the armed forces, when elections were only a few months away?

For 28 years we have sincerely tried to build and run a democratic society. Others have maintained that a country of our poverty, our diversity, our illiteracy, could not hope to be democratic. But we have been able to ensure a climate of freedom for our people. Almost every year brought some challenge and crisis. Five times we have had to defend our country against external aggression. We have had to withstand pressures from those who did not like our foreign policy of non-alignment. Regional pulls had to be contained and resolved through resilience and conciliatory firmness. We have undertaken a massive program of State-initiated development without destroying private enterprise. There have been strains and contradictions. But we have gone ahead in the faith that democracy, although it builds slowly, builds surely.

For this we received little thanks. We have been accused of being a soft State, which ought to emulate the results achieved by our totalitarian neighbor. And last week some shed tears for an India that had a "democracy of sorts" but abandoned it.

The state of emergency was proclaimed because the threat of disruption was clear and imminent. When an organized attempt is made to exhort workers and farmers to withhold work and produce, when government offices are not allowed to function, when students are advised to boycott schools, when duly elected legislators are called upon to resign, when open statements are made that the prime minister will not be "recognized" and that Parliament will not be allowed to function, in spite of the clear verdict of the highest court of the land that I am legally entitled to function as prime minister, and when, finally, a call is given by a combination of five parties for countrywide civil disobedience, and, over and above all, the armed forces and police are publicly asked to disobey orders—is the situation not grave? These were not the actions of a lunatic fringe to be ignored. There has been sabotage in Bihar and disruption of the administration this last year. Now it was to be a nationwide program proclaimed by supposedly responsible leaders. They were ready to adopt extra-constitutional methods and deliberately cross those limits and self-restraints that are basic to democracy. To permit them to go ahead would have meant conniving at the beginning of the disintegration of the bonds that hold the country together.

What has been done is not an abrogation of democracy but an effort to safeguard it. Preserving the integrity of the fabric is a major challenge in the early years of any new nation. Our Constitution-makers were fully aware of the problems involved and knew that although our diversity had to be accommodated through federalist provisions, the center should hold at all times and should have sufficient power to deal with threats to unity and order. When there are constitutional deadlocks in a state, the Union takes over the administration of the concerned state. This is an example in which our Constitution provides for contingencies that may be peculiar to our situation but may not obtain in an established, old republic like the United States.

Every country arms itself with powers to meet external threats and internal disorder. Making use of such provisions cannot be termed unconstitutional or anti-democratic. The action we took was warranted by a specific provision (Article 352) of our Constitution and was therefore within the constitutional framework. It is subject to Parliament's ratification. Although the rights to move courts have been held in abeyance, there is provision for review of the cases of the arrested, and the basic democratic structure has been undisturbed.

I might also point out that three of our states have governments of parties opposed to mine and that they are functioning. Although some opposition leaders—those directly associated with the



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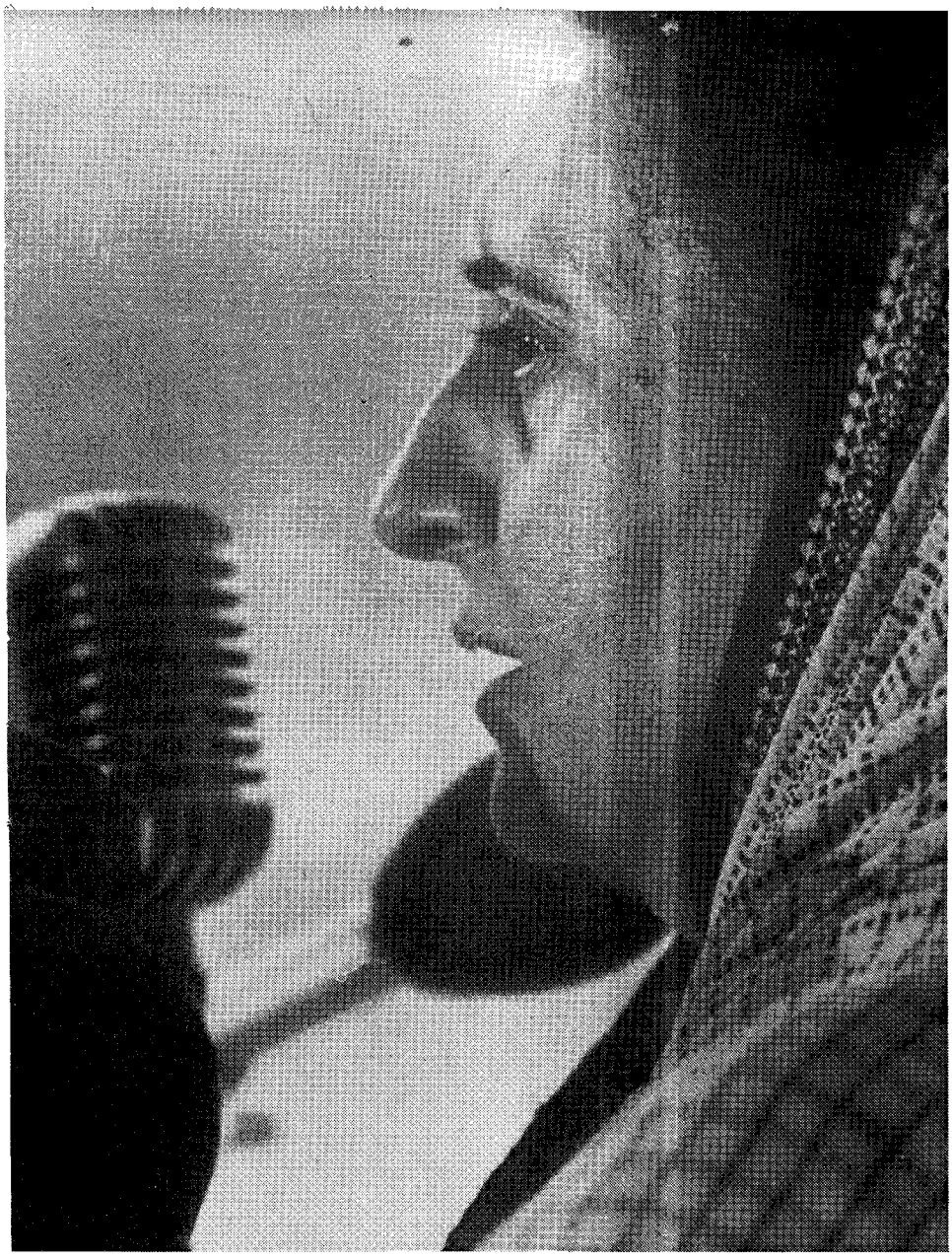

Gian-Franco Gorgoni: Gamma

*Mrs. Gandhi speaking in New Delhi—"I do not believe that a democratic society has the obligation to acquiesce in its own dissolution."*

plans for countrywide defiance of authority—have been taken into custody, many senior leaders of these parties are untouched. Their parties are legal. Only a few extremist groups that do not claim belief in democracy or in the equal rights of minorities or in peaceful action have been outlawed. Anyone who has been in India in these weeks will tell you that there is no police-state climate. On the contrary, the move has been welcomed by the vast majority. Naturally, those who have opposed the government from the beginning are not reconciled. A few who were initially bewildered by the rapidity of events now seem to have a clearer appreciation of the situation. In fact, there is a feeling of a new beginning, a sense of discipline, fresh involvement, and enthusiasm for work.

The word *dictator* has been flung at me for over a year. Indeed, even my father was called one!

*What in your view would represent a fatal blow to Indian democracy?*

**Mrs. Gandhi:** Indian democracy will be threatened when any party of the extreme Right or extreme Left comes to power. It is being weakened by those who, claiming to be non-violent and democratic, give respectability to, and ally themselves with, fanatic religious organizations and with parties wedded to terrorism. What holds India together is the trust that all regions and all its religious groups will have a fair deal. If a political alliance that depends upon the muscle power of the sinister Rashtriya Swayamsevak Sangh (RSS) should come to power at the center, then not only Indian democracy but even India's very integrity will be threatened.

The RSS has for years preached an extreme form of Hindu chauvinism and has wanted our 60 million Moslems and 14 million Christians to be treated as less than full citizens. It has built up paramilitary cadres. We also have the Naxalites, who claim to be Marxist-Leninists but whose policies are those of murder. Finding little support among the people, Mr. Jayaprakash Narayan and Mr. Morarji Desai have befriended the Naxalites. Last year in Gujarat and Bihar, Mr. Narayan's followers demanded that legislators resign. Their families were threatened and their houses burned. To give a less extreme example, Bibhuti Mishra, a veteran freedom-fighter of Bihar, has been winning his parliamentary seat with huge majorities—a plurality of 130,000 votes last time. About 50 students, not one belonging to his constituency, surrounded him, shouting that he had lost the people's confidence and trying to compel him to sign a letter of resignation to the Speaker. Even after the recent elections in Gujarat, the houses of three Christian families were burned, because they had voted for our Congress Party. Such attitudes and actions shake the foundations of democracy.

*Does India require a more authoritarian form of government so that it can solve its problems?*

**Mrs. Gandhi:** Not a more authoritarian form of government, but a system that will infuse a sense of greater discipline and can deal with economic and administrative laxness.

We also have to think of reforming our legal system. Over the last two centuries, we have adopted the Anglo-Saxon juridical system, which often equates liberty with property and has not made adequate provision for the needs of the poor and the weak. Although our legal system has given a degree of ballast to society, it has not fully assimilated our national experience or anticipated and facilitated social change. When we wanted to abolish traditional landlordism, when we wanted to nationalize banks in order to break the monopoly of a few business houses, when we wanted to do away with the feudal princely order, the law said

*(Continued on page 48.)*



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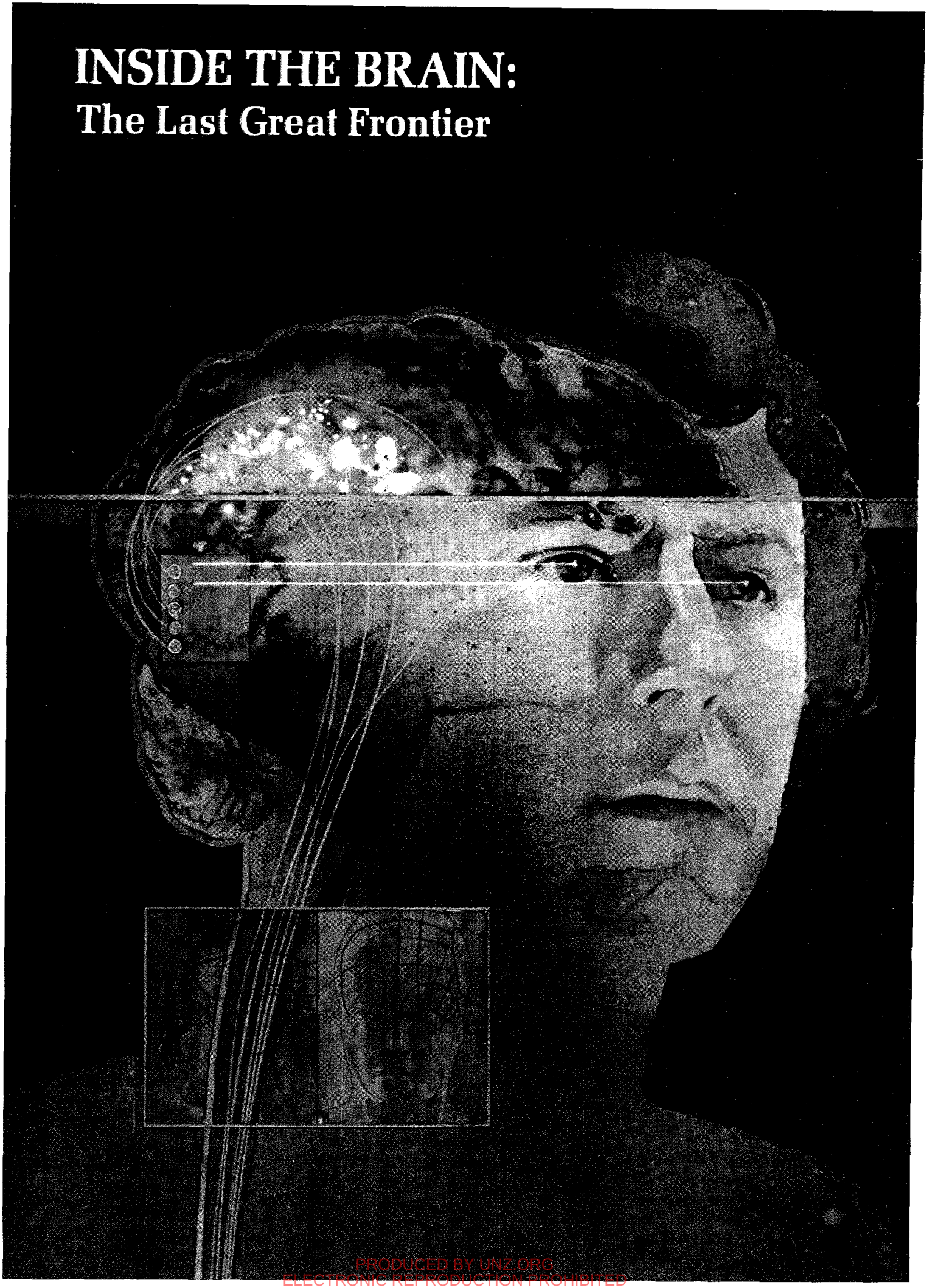
# INSIDE THE BRAIN:
## The Last Great Frontier



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# High on hope, today's neuroscientists edge ever closer to an understanding of the most highly organized three pounds of matter in the universe.

This special section is devoted to pathbreaking new research being done on that mere double-handful of gray stuff inside our skulls called the human brain. Considering the miracles the brain performs, it certainly doesn't look like much, and it weighs only about three pounds. But they are a mighty three pounds—perhaps the most highly organized three pounds of matter in the known universe.

The brain is believed to contain something on the order of 100 billion cells. Ninety billion of these are the so-called glial cells, named from the Greek word for glue. They are the bricks and mortar, the supporting structure, as well as the indispensable service organization for the *real* brain: the remaining 10 billion cells—the nerve cells, or *neurons*—that form the "substance" of the thinking-and-feeling instrument by which we sense our own existence. When we speak of brain cells, neurons are what we usually mean.

These cells are not evenly distributed throughout the brain. In some areas they are packed together at a density of 100 million to the cubic inch. And each neuron may be connected with as many as *60,000* others, no two of which are exactly alike.

Every neuron is a highly sophisticated data-processing unit, screening thousands of incoming signals and deciding how and when to respond. A single neuron contains millions of RNA molecules—those molecules that carry the genetic instructions from the DNA and translate them into protein manufacture. All in all, the neurons are equipped to turn out 100,000 varieties of protein. Even with the most advanced computers to assist it, the human brain can hardly grasp its own complexity.

We may sleep at night—at least our conscious minds may sleep—but the brain and its myriads of busily firing cells never sleep. Their activities go on day and night, throughout our lives.

The brain is the controller, the organizer, the information-processing center of the body. It is the boss. It runs the show. And it *acts* like the boss, freely exercising its privileges and prerogatives. Though it makes up only 2 percent of the body's weight, it hogs 20 percent of the blood supply. Like the leader of a pride of lions, it also "eats" first—that is, it takes its share of nutrients from the blood, no matter what goes elsewhere. In case of malnutrition, it is the last to starve.

To us today it seems obvious that the brain is the seat of mind, thought, and sensation. It was not always so. Until very recent times in history, other organs—such as the heart or even the liver—were considered to be the seat of mind or of soul. Sometimes the human breath, or even the blood, was believed to contain this vital essence. Aristotle thought the brain's main job was to cool the hot blood as it passed through.

The brain remained largely unknown territory until the nineteenth century. Progress remained slow until the past few decades of this century, during which time there has been a veritable explosion of new knowledge. We are still far from understanding all the brain's mysteries. But scientists have now probed into all regions of the brain, layer by layer, almost cell by cell, and now down to the molecules *within* the cell.

Neurons, like all other body cells, are governed by the DNA in their nuclei. Though it is still a matter of great controversy (and there is too little evidence to settle the matter), many scientists think that the individual's very cast of mind and mold of thought, as well as all the biological processes of the brain, are written into the genetic code.

One might almost say (and many people do) that we have *two* brains (and this is a distinct and separate concept from the left-brain, right-brain phenomenon that Roger W. Sperry writes about on page 30). There is the conscious, reasoning brain, the analytic intellect, housed in the cerebral cortex, the topmost layer of the brain, and the latest to develop in human evolution. This brain governs the central nervous system via the spinal cord and a network of nerves capable of transmitting electrical impulses throughout the body. And there is the "primitive" brain, the old, old, earliest-evolved brain, deep down, covered over by the intricately wrinkled cortex. This brain, much smaller, governs respiration, pulse rate, blood pressure, and the body's salt balance. It governs the appetites and often the moods: hunger and thirst, cold and heat, sexuality, aggression, and the entire "autonomous" nervous system—including the endocrine system of hormone-producing glands, which communicate biochemically rather than bioelectrically. In this primitive brain may reside much of the "unconscious mind"—the emotional, irrational parts of the mind.

The two brains are, of course, intimately interconnected, often in ways we are not aware of. Every doctor knows that a person's mental outlook can affect his physical well-being and vice versa. And every psychiatrist knows that emotional disturbances on the unconscious level can upset functioning at the conscious level. A conscious awareness of danger or excitement, even "purely" intellectual excitement, can communicate itself to the primitive brain, set hormones loose in the blood, and trigger a whole chain of physiological events.

One thing is clear: if we can understand the brain—the *whole* brain—then we can modify thoughts, feelings, sensations, emotions, attitudes, and many functions we think of as purely bodily in nature. To modify the brain would thus be to modify behavior. The new knowledge indeed suggests that virtually complete control might be exercised through the physical manipulation of the brain, and here the term "physical" is used to include chemical, biological, electrical: the *matter* of the brain, rather than what we customarily think of as the pysche or the spirit.

In fact, many brain investigators believe that matter and mind (or spirit) are one—that when matter is organized with sufficient complexity, it begins to manifest the qualities we associate with mind. It has been shown, for instance, that mental illness or disturbance is often accompanied by changes in the chemistry of the brain, and a now-famous maxim is: "no twisted thought without a twisted molecule."

Using the same metaphor, if we could "untwist" those twisted molecules, we might hope to alleviate or cure many forms of mental illness. If the original disturbance were caused by environmental or social factors, then, of course, physical remedies would only serve as interim tranquilizing agents until the environmental and social factors were dealt with.

*(Continued on next page.)*

Bob Dacey



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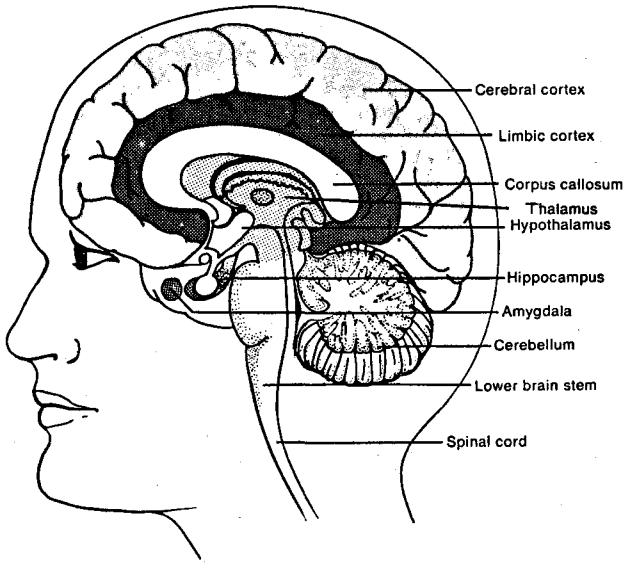
What other desirable results might we conceivably gain from intervening in the brain's processes?

Well, each of us would like to think more clearly. We would like to experience our sensations more joyfully, to keep ourselves mentally and physically healthy, to learn and remember better, to "know who we are" with a greater sense of wisdom and maturity, to be more creative. It all depends on our individual goals. Here again, though we might be helped by physical controls, true and long-lasting sanity can be attained, and maintained, only in a congenial human environment and in a sane society.

The prospect of the human brain in control of the human brain does not evoke unanimous enthusiasm. Nor should it. Even matters of individual prerogative are controversial; not everyone agrees, for example, that it's all right for a person to hallucinate in private on LSD. What sets off our real alarm signals, however, is the thought of some individuals (other than benevolent therapists ministering to consenting subjects or patients) controlling the brains of others. In that case the individual owner of the controlled brain is not necessarily the one whose goals would be served.

Not that brain or mind control is a new idea. Many indi-

# A Layman's Guide to the Brain

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The brain is divided into sections, called lobes, by deep grooves. Each lobe is associated with some specific function, although these divisions are not clearcut. The rearmost lobe, the *occipital* lobe, is associated primarily with seeing. The *temporal* lobe, located directly under the temple, is largely concerned with hearing and also plays a prominent role in memory. The *frontal* lobe is vaguely associated with judgment and other elusive aspects of personality.

## The Cerebral Cortex

The outer surface of the human brain is grayish pink and deeply wrinkled. Its consistency is something like that of very thick custard. The covering or *cortex* (from the Latin word for "bark") is only about a tenth of an inch thick, but it is presumably responsible for man's higher mental capabilities. As creatures with greater mental capacity evolved, their brains became increasingly wrinkled and crumpled in appearance as the ratio of cortex (or surface) to the brain's volume increased, reaching its highest level in man.

## Central Nervous System

The brain and spinal cord make up the *central nervous system* (CNS). The CNS can be divided into essentially three parts, in accord with its three major functions:

(1) INPUT. The outside world can be thought of as *putting* information *into* the CNS in a constant flow—but the CNS is very selective about the information it accepts; otherwise, we would be inundated with unmanageable quantities of data. The input is thus what those cells called *sensory receptors* are designed to accept from the world's output—e.g., light for the eye, sound for the ear, temperature variations for the skin—which they then translate into the electrical language of the CNS.

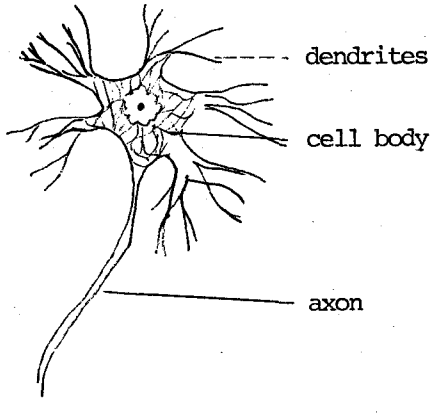
(2) OUTPUT. A segment of the CNS is charged with *putting out* commands, especially to the muscles. In walking, for instance, many muscles have to know exactly how much to move or contract, in which direction, and with what amount of force—and all in precisely timed coordination. This orchestration is the job of the *cerebellum*, which sits atop the medulla and serves as traffic manager for signals headed into and out of the spinal cord. (The elements that govern muscle movement constitute the *motor system*.)

(3) CENTRAL PROCESSING. Most brain cells (*neurons*) are concerned with interpreting sensory input and deciding what to do in specific situations. This executive process is aided by previous experience stored in the memory. (*Memory*, incidentally, does not seem to be stored in any particular part of the brain, but is, rather, a property shared more or less by all the cells.)

## Neurons

Just as the CNS is an information-processing system, so is the individual brain cell, on a miniature scale. All neurons share certain common properties. The "typical" neuron has three parts essential to its function. The signal-receiving, or *input*, part, often spread like sensitive fingers, is made up of *dendrites*. On the *output* side there is only a single *axon*, a slender fiber that may be quite long. (Some motor-system neurons, for example, extend all the way from the cerebral cortex to the base of the spine.) Between dendrites and axon lies the cell body that contains the nucleus and other life-support machinery of the cell.

What makes neurons special among the body cells is the *excitable membrane* that surrounds them. This membrane contains a molecular pump that expels electrically charged particles from within the cell so that a small voltage normally appears across it. When a neuron is activated, the electrical resistance of a portion of its membrane drops sharply, as if a short circuit had occurred, so that the voltage across it suddenly changes. The resultant electric "blip" propagates



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vidual brains have been controlled, to some degree, via drugs or hypnosis. Some nations have developed to a high degree of precision—and have not hesitated to practice—the by now well-known technique of psychological "brainwashing." Moreover, we routinely exercise control, or seek to, over people's minds in many ways—through persuasion, advertising, propaganda, education. Physical control, however, does add a special dimension with its own special dangers and implications.

Fortunately, most brain investigators—including those whose work is described in the following pages—are responsible scientists who are aware of the implications of their work. As an added protection, many bioethicists have become specialists in this very area of concern, and they are increasingly listened to. It seems unlikely that our new knowledge of the brain will be applied without careful scrutiny and forethought. Neuroscientists, by and large, when they think about "brain control," do not envision new means for the mass manipulation of behavior, but rather an understanding that will enable free individuals to attain better command of the quality of their own living experience.

ALBERT ROSENFELD and KENNETH W. KLIVINGTON

from one end of the axon to the other. Only the *time between* these neural impulses is variable; their size and duration are fixed for any one neuron. It is possible, using an extremely fine wire inserted into the brain, to record these impulses—impulses of which the language of the brain is composed.

Associated with excitation and inhibition of a neuron are small fluctuations in the voltage across its membrane. The combined effect of these fluctuations in millions of neurons in various regions of the brain is what produces the *electroencephalogram*, or EEG, the signal—measured in millionths of a volt—that can be picked up by wires on the scalp.

## Synapses

Between the axon of one neuron and either the dendrite or the cell body of the next is a break in the transmission line. This gap, or *synapse*, deserves special attention because of the peculiar method of getting information from one cell to another. Just as there are many kinds of neurons, so there are many varieties of synapses, but the pattern of action for most of them is simple. When the neural impulse reaches the end of the axon, it causes that cell to squirt a minute amount of a chemical *neurotransmitter* into the synapse. The molecules of the transmitter chemical cause a change in the membrane of the dendrite or cell body on the other side of the synapse—a change that may be either excitatory or inhibitory. Since one neuron may receive stimuli from many thousands of others, the net effect of all the excitatory and inhibitory inputs will determine whether that cell fires or remains silent. This is the decision-making process that is central to the executive role of the brain.

## Flow of Information

Sensory receptors cover the surface of the body. Each is specially designed to receive physical or chemical stimuli and consequently initiate an impulse in a neuron connected to it—the first sensory neuron traveling toward the brain. These electrical signals from eyes, ears, skin, nose, or tongue will eventually be interpreted as sight, sound, touch, smell, or taste. The first sensory neuron carries the effects of stimulation either into the spinal cord (if the receptor is on the body surface) or directly into the brain if it lies on the head (the auditory nerve is a bundle of nerve fibers running from ear to brain). Axons of sensory nerve fibers relay their messages to a second set of neurons once they enter the brain or spinal cord.

Cell bodies of the next set of neurons on the transmission line are clustered together in *nuclei* of cells (not to be confused with the *nuclei* within the cells), all of which have similar functions. These nuclei are connected to one another by bundles of axons, many of which are covered with an insulating layer of fatty material called *myelin*. Sensory signals usually pass through several synapses as they travel to higher levels within the brain, one in the spinal cord, one at the base of the brain—the *medulla*—one in the *midbrain*, one in the *thalamus*, the major distribution center for all sensory information, which is located at the very center of the head, and, eventually, arrive at the cerebral cortex. All of the myelinated bundles of nerve fibers constitute the *white matter* of the brain; the nuclei, including the cerebral cortex, the *gray matter*.

Neurons are more than simple repeaters of the information they receive. As sensory information passes from nucleus to nucleus in the brain, we find that neurons respond to increasingly abstract aspects of the patterns of sound, light, or whatever stimulus. In the visual system, for example, cells in the retina may respond best to a spot of light of a certain size. At an early relay station in the thalamus, cells also respond to spots, but with sharper boundaries. Further on in the cortex, some cells "see" only strips of light with a specific orientation. Others are still more selective and respond to the length of the slit as well.

Similar principles apply to other sensory systems. The process of passing on information about only certain select aspects of the stimulus and throwing out the rest is *feature extraction*, presumably saving those features of the stimulus that are important for the brain to receive.

## Other Brain Functions

Many of the brain's "housekeeping" duties are performed by the *hypothalamus*, a set of small cell clusters (nuclei) collected together on the underside of the brain, below the thalamus. Here are located the "thermostat," which regulates temperature response, and the "appestat," which tells us when we are hungry or thirsty. The hypothalamus also controls the entire endocrine system by controlling the *pituitary*, the so-called "master gland," which cannot release any of its hormones until the hypothalamus has first sent out its "releasing factors."

Another set of nuclei related to the hypothalamus forms a loop around the thalamus and interconnects with other nuclei throughout the brain. This loop of nuclei makes up the *limbic system*, which is largely involved with the expression of emotions.

Also much involved in the emotions, especially aggression, is the *amygdala*, which is buried deep in the temporal lobe. Surgical removal of the amygdala can have a quieting effect on even the most aggressive of creatures.

Other parts of the brain have to do with the production and regulation of movement. Chief among these is the *extrapyramidal system*, made up of several nuclei found near the core of the brain.

Much remains to be learned about the mechanism of brain function, but neuroscientific research is rapidly filling the gaps in our understanding. □



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Paul Spina

## SPEAK, MEMORY:

# The Riddle of Recall and Forgetfulness

### Ingenious new research with goldfish and rats holds promise for eventual control of the still-elusive mechanisms of memory.

by Maya Pines

Every day, the 49-year-old man reads the same copy of the *Reader's Digest*, which seems eternally new to him. If you meet him, he appears quite normal—but if you leave the room for 15 minutes and then return, he thinks he has never seen you before. He cannot recognize his next-door neighbors. His family moved to his present house 22 years ago, shortly after he had a brain operation to relieve him of severe epilepsy. As a result of this operation (which was experimental and has never been performed on anyone else in the same way, now that its effects on memory are known), he cannot form new memories. Unlike some victims of amnesia, he remembers his early past very clearly, but every new thing he does, says, sees, or feels disappears from his mind so quickly that his own life since 1953 remains a total blank.

Thousands of old people suffer from mild forms of such impairment, simply as a result of their age. "My mind is like a sieve," complains an 85-year-old woman. "I don't remember anything I read in the newspaper—don't know why I read it. But I remember very clearly what happened long ago. . . ." Many other persons have transient, but frightening, lapses of memory after receiving shock treatment for depression.

Memory sometimes fails, but it can also preserve events with extraordinary precision and detail for nearly a century after they have occurred. We still know very little about this precious quality. Nevertheless, we are beginning to control it. Scientists can already improve or destroy the memory of animals with surprising ease. And now, amid much excitement, a new crop of drugs that might help the aged to retain their memories is about to be tested. However, scientists, such as Dr. James McGaugh of the University of California, Irvine, warn that it will take at least a decade before such drugs—if they work—go past the experimental stage.

THE PAST TWO YEARS have been especially rewarding for memory researchers, whose subject has always been the most difficult and exasperating of all



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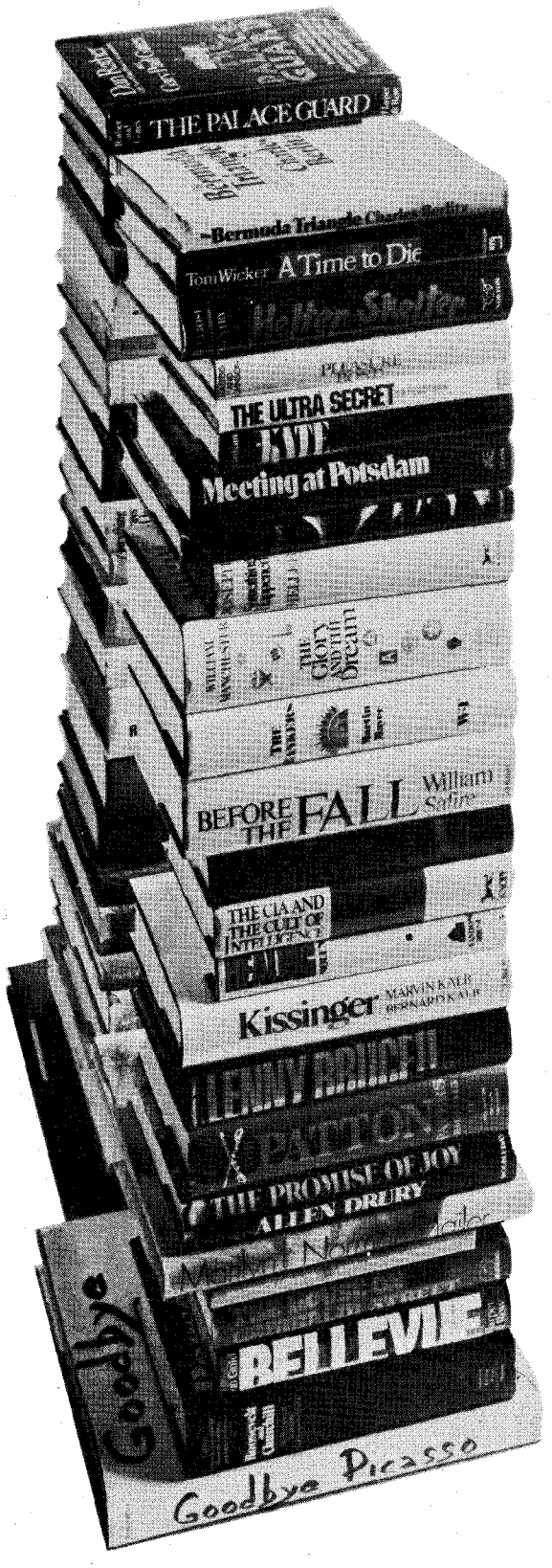


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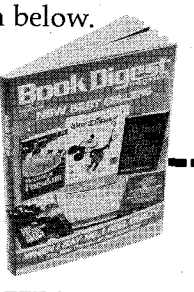


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areas in the brain sciences. For a long time progress was slow because it was thought that memory depended entirely on electrical activity—on electrical circuits in various parts of the brain which laid down lasting patterns, or "engrams." Harvard's famed neuropsychologist Karl Lashley spent a lifetime looking for such engrams. Convinced that they must be located somewhere in the cortex, he trained thousands of rats to run mazes and learn other skills, then systematically cut out piece after piece of their cortex, expecting that at some point this would also wipe out the memory of their training. But no matter where he cut, the memory survived. Even when the brain injury was severe enough to make the animal limp or stagger, even when 90 percent of its visual cortex had been removed, the rat still found its way across the maze. Finally, after decades of struggling with the problem of how information is encoded in the brain and how people learn, Lashley came to the tongue-in-cheek conclusion that "learning is just not possible at all."

ABOUT A DECADE AGO reseachers began to emphasize the chemical aspect of memory. Whatever memory consisted of, it clearly had to have some chemical component; otherwise, long-term memories would not survive deep-freeze hibernation, electroconvulsive shock, coma, anesthesia, or other conditions that radically disrupt the electrical activity of the brain. A chemical trace would also explain why memories are so widespread—why the engram eluded all who tried to find its specific location in the brain.

The chemical approach led to a series of intriguing experiments in the United States and abroad. At the University of Michigan's Mental Health Research Institute, for example, Dr. Bernard Agranoff, a biochemist, began to inflict memory losses on goldfish. After his treatments, the fish had much in common with the old woman who complained that she could not remember what she had just read in the morning paper. Dr. Agranoff did not cut anything out of the goldfish's brains, nor did he do any permanent damage to them. He merely injected some puromycin, an antibiotic that blocks the formation of protein, into their skulls immediately after they had learned a new skill, and the skill vanished.

It vanished because, according to current theories, there are several stages of memory—short-term memory, long-term memory, and perhaps some others in between—and moving from one stage to the next requires a chemical step. Unless a new impression is fixed by some chemical process in the brain, it will fade away. The puromycin apparently interfered with this step.

Normally, goldfish that have learned to cross an underwater barrier in their tank whenever a light is flashed (in order to avoid a mild electric shock) will remember this skill for at least one month. In order to make the goldfish forget it, Agranoff had to inject his puromycin immediately after the training session. If he waited as long as one hour, it was too late—the memory had been fixed. He could also administer the injections *before* the training began; in that case, the fish would learn to avoid shocks just as rapidly as any other fish and would even remember it for a short time, but three days later all memory of the training had disappeared. This finding showed that the chemical had no effect on the acquisition of memory but acted on its consolidation, which occurred during the hour immediately following the event.

Entranced by the possibility of wiping out specific memories of something just learned—of a murder, perhaps, or the location of military secrets—in this fashion, a reporter once asked Dr. Agranoff, only half in jest, whether the CIA had been in touch with him about his work. Agranoff smiled and replied, "I forget." His own experiments have been limited to animals, however, and he is quick to point out that puromycin could have lethal effects on man. Almost defensively, he emphasizes that his real goal is to learn how memory deficits occur in the aged and in people with degenerative neurological disease, so as to prevent this loss. "The only way we have to study the fixation process is to disrupt it," he declared.

*Maya Pines, who is author of* The Brain Changers, *has contributed numerous articles about science to national magazines.*

## The Morning After

Just what *did* happen at last night's party? We've all experienced some form of the amnesia produced by alcohol. But scientists separate such forgetfulness into two types: (1) *fragmentary* amnesia, in which a half-hour may be blacked out while the next hour is remembered, and temporarily forgotten events from the "missing" half-hour may suddenly be recalled if something reminds the subject of them, and (2) *alcoholic "blackouts,"* total and seemingly permanent, covering a period of hours or days.

The difference is important, for only the blackout is really lost time. In blackouts people are just as crippled—for the time being—as the man in the accompanying article who suffered the disastrous brain operation that destroyed his memory. A person who realizes that he has had such a blackout usually feels, at first, "a sense of dread or apprehension," according to Washington University psychiatrist Dr. Donald W. Goodwin and his colleagues. The blackout victim wonders whether he might have harmed or killed someone. He was fully conscious during the whole blackout period and was able to perform complicated acts—traveling long distances, for example, or writing letters or checking into hotels. But no amount of memory jogging will make him recall that he did these things. Apparently, the consolidation process, which turns short-term memories into permanent ones, is seriously disrupted in such cases, and Dr. Goodwin believes that more is involved than just alcohol. There is often a history of head injuries or else extreme fatigue, lack of food, or the simultaneous use of drugs.

Fragmentary amnesia, by contrast, is more like a fog—an alcoholic haze—which sometimes lifts, showing that the events have been recorded in the brain and even put into permanent storage, but have somehow been blocked from the conscious mind. Such memories return in much the same way as do memories blocked by electroconvulsive therapy. That is, they come back in a sporadic, spotty fashion. But, according to Dr. Goodwin, these memories remain rather dim and often have an unreal quality "like a picture out of focus" or like "a remembered dream."

What actually goes on in the brain during both kinds of amnesia remains a mystery. M.P.



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If the consolidation of memory could be disrupted, could it also be improved? At Irvine, Dr. McGaugh decided to give it a try. Years earlier, he remembered, Karl Lashley had shown that animals would learn new skills more rapidly if they were given stimulants such as strychnine before the training. These experiments were difficult to interpret, however. The drug might simply have made the animals more alert or more eager for the food reward; it did not necessarily affect their memory. To clarify the situation, McGaugh left a group of rats alone during their training and *then* injected the strychnine. He saw at once that the more strychnine he gave them, up to a point, the better they learned. Instead of going to the wrong arm of a maze about 25 times before grasping that they had to choose the white alley at every turn, the mice that had received the largest dose of the drug learned after only five or six errors.

These dramatic results were soon duplicated with metrozol, a convulsant drug, and with amphetamine, although these two chemicals had to be injected within 15 minutes after the training session, while the strychnine could be given as much as an hour later. After trying several different drugs, in graduated doses, at varying times, and with different kinds of learning tasks, McGaugh concluded that he had made his case. "The robust nature of the effect is beyond question," he declared. "The effects are as long-lasting as those of ordinary memory. What we produce is either a quicker or a stronger consolidation of memory, so that whatever is learned is learned better."

The drugs could even bring back memories that appeared to have been suppressed by electroconvulsive shocks. "We can now block and unblock," said McGaugh, a psychobiologist who is currently vice-chancellor of Irvine. "If we produce retrograde amnesia by electroshock, we can undo it with drugs. But all this is time-dependent."

From the point of view of the aged, the most interesting aspect of such experiments was the discovery (by other researchers) that old mice and rats responded to the memory drugs much better than did young animals: their memory improved even when the amphetamine was injected two hours after a training session, for instance, while young rats had to have it within 15 minutes of their training. Evidently, their memory-fixing process had slowed down. It might then be speeded up and sharpened with drugs.

This finding led to the hope that effective memory drugs might soon be developed to help old people whose memory had begun to fail. But there remained a major hurdle: all the drugs that seemed effective were either addictive (amphetamine) or poisonous (strychnine), or they led to convulsions.

Enter the hero of this story: a Dutch pharmacologist, Dr. David DeWied of the University of Utrecht, who works with substances that the body produces naturally and are thus much safer. His most recent experiments on animals have led to a tremendous feeling of excitement among researchers.

The new substances are natural hormones, such as ACTH, which the body produces in response to stress. Until a few years ago, scientists believed that ACTH acted only as a messenger, going from the pituitary gland at the base of the brain to the adrenal glands atop the kidneys and ordering them to release their steroid hormones. ACTH was not supposed to act directly on the brain. But it now turns out that ACTH has two different functions, and that one of its components—which does not affect the adrenals at all—is clearly related to the fixation of memory. Dr. DeWied narrowed this down to a small chain of four amino acids, $ACTH^{4-7}$, although most researchers are working with a slightly larger component called $ACTH^{4-10}$. Judging from the results of a recent flurry of research, this chain of chemicals alerts the memory machine to the importance of an event and orders the brain to "print"—to fix the short-term memory so that it can go into permanent storage.

Treating animals or people with this natural chemical would be much like revving up their normal memory mechanisms. It might prevent them from forgetting certain events or skills—a mixed blessing, depending on how it was used.

Doctors who believe that electroconvulsive therapy is the best treatment for severe depression have long wished for some way to reduce the amnesia that follows the shocks. It is not surprising, therefore, that one of the first experimental uses of the new substance in human beings has been with patients undergoing such treatment. Previous work in the Netherlands had shown that $ACTH^{4-10}$ would prevent a loss of memory in rats that had been given electroconvulsive shocks. Tests are now under way in Indiana to see whether the same will prove true in human beings.

The next step is to try out these chemicals on the aged. This will be done, starting this summer, in two New York hospitals, according to Dr. Max Fink, a professor of psychiatry at the State University of New York at Stony Brook, who is monitoring American studies of the effects of $ACTH^{4-10}$ on human beings. At present, the hospitals (New York Medical College and NYU College of Medicine) are working only with younger, normal volunteers.

Dr. Fink adds that chemists in the Netherlands have succeeded in making synthetic $ACTH^{4-10}$ that is 1,000 times more potent than the original—a great advantage, since a chemical of this strength could be taken by mouth, in pill form, rather than through injections.

**"In the future we may decide to take amnesic drugs before events so horrible that we want no permanent record of them, or we may seek a heightening of experience through drugs that sharpen our memory."**

As if this were not enough, last March Dr. DeWied announced that yet another hormone, vasopressin (which is produced by the hypothalamus and stored in the posterior pituitary), has even more dramatic effects on the memory of animals. While $ACTH^{4-10}$ will prevent rats from forgetting a new skill for some time, vasopressin appears to engrave it in their memories forever. It has not yet been tried out on human beings.

EVENTUALLY doctors may learn to measure the hormone level of people who have lost their memory and then to correct it, if necessary, with pills. What causes senile forgetfulness remains a mystery, but it may well involve the brain's inability to synthesize certain hormones. Even though the amino acids from which the hormones are made can be found in common foodstuffs, an active pituitary or hypothalamus is required to make them—unless they are made available as drugs. Possibly some kinds of mental retardation that involve



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poor memory might also be relieved to some extent through such drugs. The memory researchers emphasize, however, that these are only speculations at the moment. They have been burned before: a decade ago, for instance, some scientists had high hopes that memory defects could be treated with RNA, but nothing came of their expectations. They do not want to have to write hundreds of letters to distraught relatives explaining that, at present, there is nothing they can do to help the senile or the retarded.

Meanwhile, McGaugh and his associate, Dr. Paul E. Gold, are trying to put various pieces of the puzzle together. They have been wondering how their experiments with strychnine and other stimulants which improved the fixation of memory in rats fit in with present experiments showing that some hormones do just the same thing. Perhaps the stimulants acted by releasing the hormones, they speculate. Or, perhaps neither of these chemicals is actually involved in the process of information storage. The researchers may have stumbled, instead, on the mechanism by which people evaluate whether a recent experience was trivial enough to forget or important enough to store in the memory files. If so, it is a considerable achievement, potentially of enormous importance for the aged. But, on the other hand, it leaves the underlying mystery of memory untouched.

The basic questions are: how does information of any sort get coded in the brain? What does short-term memory actually consist of? How does a memory become permanently fixed? How do memories change with time, as they often do? How do people retrieve any specific memory, out of the welter of a lifetime's experiences? And how do they forget? Neither the scientists who study behavior nor those who work with microscopic particles of brain tissue or chemicals have any answers. Yet these questions are at the heart of everything that makes us human.

In some cases it may be dangerous to remember too well. The Russian psychologist A. R. Luria poignantly described such dangers in his book *The Mind of a Mnemonist*. The man whom he studied, S., never forgot anything. He had no difficulty reproducing any lengthy series of words whatever, wrote Luria, "even 15 or 16 years after the session in which he had originally recalled the words." He did not have to "memorize" data, but simply "registered an impression," which he could "read" at a much later date. Luria soon gave up trying to find the limits of his memory—there were none. On first acquaintance, however:

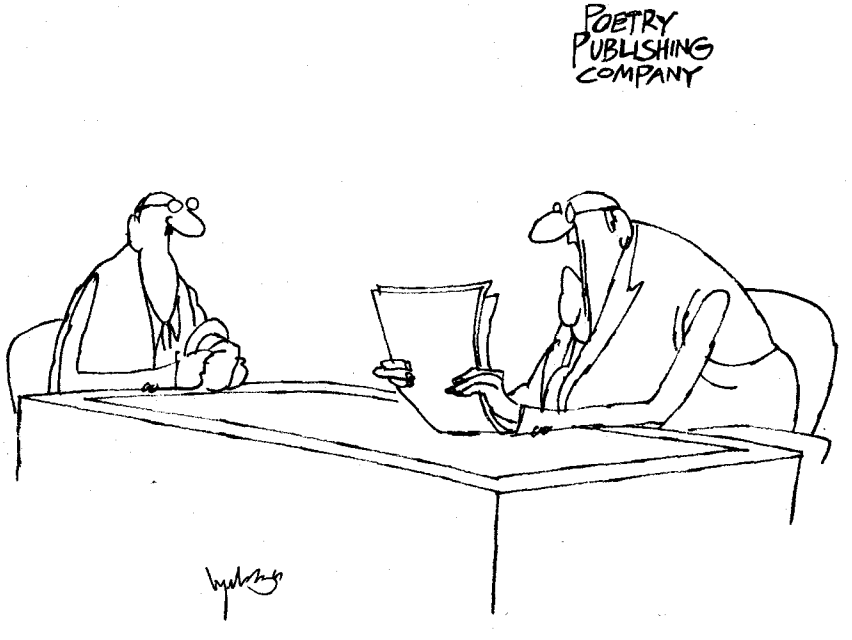
> S. struck one as a disorganized and rather dull-witted person, an impression that was even more marked whenever he had to deal with a story that had been read to him. If the story was read at a fairly rapid pace, S.'s face would register confusion and finally utter bewilderment. "No," he would say. "This is too much. Each word calls up images; they collide with one another, and the result is chaos."

Finally, Luria discovered the terrible flaw that went along with S.'s perfect memory: because he remembered every specific image, he was never able to single out the key points in a situation. Thus, while he could recite long texts, his grasp of their total meaning was not good. After S. began working as a mnemonist, a further problem came to plague him: he could not forget images that he no longer needed. He sometimes gave several performances a night in the same hall, where the long charts of numbers that he had to recall were written on a single blackboard and then erased before the next performance. But in his mind's eye, he still *saw* them in the same place. "When the next performance starts and I walk over to that blackboard, the numbers I have erased are liable to turn up again," S. complained. He even thought of writing things down so he would forget them, but it did not work. There seemed to be some failure in the metabolism of his short-term memories: whereas old people have difficulty converting any of these into permanent memories, S. was forced to convert them all. Conceivably, he suffered from an excess of the hormones DeWied has been studying.

IN THE FUTURE, we may be able to select either one of these alternatives at various times: we may decide to take amnesic drugs before events so horrible that we want no permanent record of them, or we may seek a heightening of experience through drugs that sharpen our memory for special occasions.

There is also a built-in danger of abuse. Memory drugs, like tranquilizers and behavior-modification therapies, may easily be forced on unwilling subjects. Children with learning problems (caused by poor teaching, perhaps), patients in institutions, soldiers, and other captive populations might be given such drugs indiscriminately. The drugs might even be combined with behavior-modification techniques, to make these "stick" better —to turn some "aversive" experience into a warning that cannot be forgotten. In other cases, people might be forced to take drugs that prevent the consolidation of memory.

As with all the new discoveries about the brain, we are being offered high-powered tools that have direct access to our identity. What we make of them depends on how effectively we plan ahead, what guidelines we set for their use, and whether we keep a close watch on what the brain researchers are doing today. □




*"You gotta get some clout in your quatrains."*



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Photographs: Delgado Laboratory

*The brain in Spain—Dr. Delgado readies chimps for an experiment in his new Madrid laboratory.*

# José Delgado: Exploring Inner Space

## By implanting wires in the brain and stimulating it electrically, a Madrid scientist is hoping to perfect a means for therapeutic control of aberrant human behavior.

by Richard Restak

It was the German physicist Werner Heisenberg who gave both fame and a name to a standard scientific dilemma: the very act of measuring and observing a phenomenon often has a direct impact that changes the nature of what you are trying to study. If, for instance, you try to get a "fix" on a fast-moving subatomic particle, the very light you shine on it in order to see it deflects the particle from its natural course. The only certain thing about this "uncertainty principle," as Heisenberg called it, is the frustration it engenders. This was surely true for would-be brain researchers until well into the current century. How to probe the structure, or elucidate the workings, of such a delicate, complex, hypersensitive organ without at the same time interfering with that structure and those workings—and without doing unacceptable damage?

A long-standing obstacle to meaningful study of the brain was the absence of any safe, relatively "non-invasive" techniques that would *not* interfere to any substantial degree with the integral functions of the particular brain under study. This lack has fortunately been resolved in recent decades, largely through the use of versatile and sophisticated electrical and chemical probes that make possible the techniques known as ESB (electrical stimulation of the brain) and CSB (chemical stimulation of the brain).

ESB—the more familiar of the two, since it has been in use much longer—is still generally thought of as an experimental technique for manipulating laboratory rats or monkeys in bizarre ways. But it has, in fact, long since gone beyond the experimental phase to become a standard tool for studying both animal and human behavior—and a well-established clinical procedure for treating certain specific disorders. One of the best-known practitioners of this art and science, as well as one of the world's foremost investigators of the brain in general, is Dr. José M. R. Delgado, for 20 years on the faculty of Yale Medical School. Delgado recently returned to Madrid, where he is chairman of the Department of Physiological Sciences at the newly created Autonomous Medical School and also director of research for the National Center Ramon y Cajalo. There are, of course, many other scientists working in the same research areas, and Delgado is not

*Neurologist Richard Restak, author of the forthcoming book* Premeditative Man *(Viking), is currently at work on a series of profiles of contemporary scientists.*



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**"Awareness of the delicate interplay between brain and environment makes possible, Delgado believes, a new type of person, the "psychocivilized person."**

in any sense the founding father of the field—as he himself takes pains to emphasize. But no one else has exploited these techniques more intensively and intelligently than he, nor innovated more imaginatively nor offered more dramatic experimental demonstrations of these methods nor written more clearly and thoughtfully about them—as, for example, in his book *Physical Control of the Mind*.

I had the opportunity to spend a week recently in Madrid with Delgado and the enthusiastic, international group of neuroscientists who have joined his team. They are engaged in an unprecedented multidisciplinary program designed to accelerate the scientific understanding of the human brain. Though Delgado has become a reluctant celebrity —often misinterpreted, as is customary with public figures—he has remained steadfastly at his work and continues to make major contributions almost routinely. Among the very recent developments that he considers most significant are these three: (1) The transdermal (literally, "across-the-skin") stimulation of the brain to relieve patients with previously intractable pain; (2) the use of two-way transdermal radio communication with animal brains, paving the way for future long-term brain-to-computer-to-brain communication in human beings; and (3) the demonstration, by CSB techniques, of the actual manufacture of certain important neurochemicals from their constituent elements, radioactively tagged on injection, in the brains of living, healthy monkeys.

And I would add a fourth, which is personally exciting and gratifying to me: Delgado has demonstrated strikingly that monkeys roving freely in the wild—analogous to free people out in the real world—are much *less* susceptible to brain control via ESB than they are when cooped up in laboratories.

All this will be better explained in a moment. But first let us backtrack a bit.

IT HAS BEEN KNOWN since the late nineteenth century that tiny electrodes (wires) can be inserted in the brain for purposes of stimulation and recording. A pioneer in this experimentation was the German scientist J. Ewald, who in 1896 drilled into a dog's skull and inserted in the hole a perforated ivory cone. Two days later Ewald slipped a series of electrodes inside the cone and made the first electrical recording of the brain. Later, in 1930, Nobel laureate Walter Hess improved on this concept by placing the electrodes in the skulls of unanesthetized cats. Once in place, the electrodes were connected by long wires to an external power source; the cats were thus free to wander the length of the wires. Although this was an improvement in mobility, it was still far short of ideal. Could methods be established that would do away with the connecting wires altogether, freeing the subjects to move about within their own natural habitat? Was there a way to eliminate the artificial limitations of the laboratory yet retain the integrity of observation?

This challenge has occupied Delgado over the course of a professional lifetime. Now 59 years old and a veteran of more than 30 years of brain research, Delgado is just getting into the full swing of his creative career. He is tall and trim with a full shock of gray hair and a tan, finely etched face. His hands, as a friend observed, "have a language of their own." Indeed, his gestures, when combined with a soft Castilian accent and eyes that are both penetrating and inquisitive, suggest a man consumed with an idea sufficiently absorbing to require, for its adequate expression, the participation of his whole being. What makes talking with him even more of a pleasure is his ability, rare among scientists of any persuasion, to communicate information about the brain in terms that can be understood by almost anyone. "We now have the technology," he affirms, "to study and directly influence the brain in such a way that its normal function is not interfered with. Moreover, our instruments are becoming an extension of the brain itself."

Delgado's interest in brain research goes back to at least 1946, when he first came to Yale as a young doctor who had been awarded a fellowship to study with neurophysiologist John Fulton. On his return to Spain, Delgado was confronted with the lack of research funds and tried to solve the problem by working for a while as a ship's doctor in order to collect, during his shore leaves in the tropics, the monkeys he now needed for his studies. During one such excursion, he was even called upon to capture an escaped gorilla; within a matter of hours he had tamed the beast sufficiently to promenade it along the ship's deck.

Two years later Delgado returned to Yale and began to establish an international reputation based on his ESB studies of apes and monkeys. In a typical ESB experiment, fine steel electrodes are inserted via a painless procedure into the brain of his subect--usually a monkey—and connected to one of Delgado's own inventions—the "stimoceiver," which is a microminiaturized solid-state radio device that both stimulates the brain by its transmissions and receives responsive signals. The latest model, about the size of a thumbnail, fits neatly beneath the scalp, permitting multichannel radio communication between the subject's brain and a radio receiver-stimulator controlled at a distance by the investigator. In the absence of bulky gadgetry, free movement of the subject is possible in a variety of settings. By sending various radio "commands" to the implanted stimoceiver, Delgado is able to modify the behavior of the animal "implantees."

At Yale Delgado established colonies of monkeys and gibbons and developed instrumentation for radio stimulation of the brain. Instead of being confined to restraining chairs or individual cages, the animals could be investigated within the relative freedom of a large colony cage in the laboratory. The next step was to study the same animals in complete freedom. In collaboration with Dr. Nathan S. Kline, director of research at Rockland Psychiatric Institute and pioneer in psychopharmacology, he is directing a fascinating experiment now in progress on Hall, a one-and-a-half-acre mini-island off Bermuda, where gibbons with implanted stimoceivers have the unrestricted freedom of the island. "On Hall," as Delgado puts it, "it is the experimenters—the stationary observers—who are in the cages, and the animals who are free."

Almost from the beginning, the gibbons reacted to ESB in strikingly different ways than they had under laboratory circumstances. In an earlier series of experiments Delgado had demonstrated that gibbons could be rendered aggressive to other gibbons in response to radio stimulation of the "central gray," a



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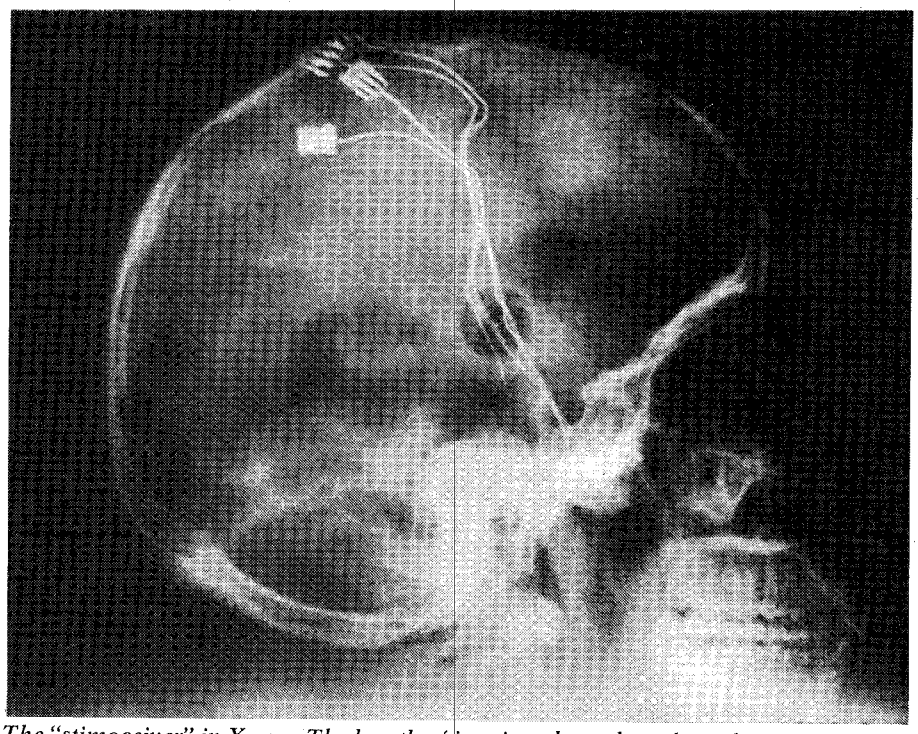
deeply placed brain-stem tract. This effect was repeatable as often as the stimulus was applied. On Hall, however, the same stimulation did *not* produce aggressive behavior. It resulted, instead, in the animal's running around without attacking. If the investigator persisted in applying ESB, the gibbon would finally become aggressive—but the aggression was directed not at his fellow colonists but, rather, at the experimenter himself!

"This should come as no surprise," explains Delgado. "Aggression is obviously not solely a matter of brain stimulation. It depends on the environment as well. Change the environment, and you will necessarily change the behavioral response. This is a very useful thing to remember for those who fear brain stimulation alone as a possible precipitator of violence."

For the past three summers, the gibbons on Hall have been the objects of intensive and systematic observation aimed at describing their behavior in terms of what Delgado describes as "mobility cycles." For 45 minutes each day, at five-second intervals, the gibbons' activity is observed and stored in a tape recorder. All of this data, some 10,000 separate pieces of information, are then analyzed by computer. From this mass of data, Delgado hopes to demonstrate in free-roving animals, as he has in caged subjects, cycles of behavior related to rhythmic neurochemical mechanisms.

"The brain has many innate patterns of activity that recur in cycles," Delgado explains. "One obvious rhythm is the one associated with our perception of the passage of time. What is the mechanism for our time sense? Is there a biological clock located somewhere in the brain?" This question is being explored by one of Delgado's teams, headed by Dr. Garcia Austt. Evidence indicates that within the hippocampus, a curved ridge within the brain, there is a way station of the limbic system known to be important in memory formation. Intrinsic brain waves, called the theta rhythm, fulfill some of the requirements for a "biological clock." "If we can modify the local theta rhythm, he says, "we may be well on our way to modifying the perception of time."

BOTH THE HALL ISLAND STUDY and the search for a biological clock typify Delgado's approach to brain research: the use of self-designed, increasingly sophisticated techniques to probe ever more precisely into currently undefined aspects of brain function. To Delgado, the questions asked about the brain can only be as meaningful as the technology available for its exploration. "The appearance of electrical technology represented a revolutionary change in the possibility for study and understanding of the central nervous system. We are now developing the technology to investigate the mechanism of awareness, personality, and, therefore, our own future behavior. The unique qualities of human behavior have their origin within the thinking brain, and the new technology allows us to explore its working neurons."



*The "stimoceiver" in X-ray—The length of its wires shows how deep electrodes can go.*

From Delgado's depth studies has emerged a radical change in our concept of how the brain learns. As far back as Aristotle, learning has been assumed to be dependent upon sensory impressions. The traditional postulate has been: there is nothing in the mind that was not first in the senses. But this assumption no longer holds in the light of Delgado's brain-to-computer-to-brain experiments, first reported in his book. Its central character was a male chimpanzee named Paddy, which had been implanted with electrodes and stimoceivers for the purpose of "teaching" the brain via computer. The neurons of a certain area of his brain, called the amygdala, spontaneously produced intermittent bursts of "spikes" (signals), which were transmitted to and identified by a distant computer programmed to respond instantly. Each time that an amygdala burst appeared, a signal was triggered through the computer to stimulate another area of Paddy's brain called the reticular formation, which is known to produce unpleasant sensations. In this way the normally occurring bursts acquired undesirable properties, and after a few hours of experimentation, the brain was unconsciously motivated to suppress the amygdala spikes. A side effect: the normally boisterous chimpanzee became more peaceful. Paddy had "learned" the new behavior pattern altogether from his remote computer-instructor via instant, self-produced ESB.

"This experiment," says Delgado, "shows that it is possible to have direct communication from the brain to a computer and back to the brain without the intervention of any of our usual senses, such as sight or sound. We now have the capacity to feed information to the brain and 'teach' it not to be epileptic or perhaps not to react in certain ways. In addition," Delgado adds, with a broad grin, "we are seeing that the brain is more 'intelligent' than we ever imagined. We can teach it to respond or not to respond in a certain way, according to the signals we feed back to it." Dr. Irving Cooper of New York is now successfully treating epilepsy by employing ESB via surgically implanted devices—though without a computer assist ("Pacemakers for the Brain," *SR/W*, January 26, 1974). Dr. Robert Heath of Tulane University



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had previously treated patients with behavioral disturbances by a technique known as ICSS (intracranial self-stimulation). What he did was to supply patients with pushbutton devices of their own so that they could stimulate their own brains by pressing a button on the portable stimulator. Other investigators have tried similar techniques or variations of them. Do-it-yourself ESB, as it might be termed, was done in only a few patients and is, of course, not as efficient as a computer hookup might be nor as quick-reacting.

A frequently recurring objection to such ESB studies and therapy is the fear that the electrodes may be harmful to brain tissue, resulting in a perhaps limited but still significant degree of damage. "Objections to our electrode studies based on their supposed harmful effects on brain tissue are scientifically unjustified," Delgado asserts. "In one experiment we evoked a smiling response in a monkey over 400,000 times without any fatiguing of the response or degeneration of nerve cells, as determined by examination of the monkey's brain after death. It is reasonable to assume that electrodes can be left in the brain for years or even a lifetime without causing any functional defects."

ELECTRICAL EVENTS are only one aspect of brain function. Neuroscientists now understand that brain activity is not merely electrical but also *electrochemical*, with vastly different chemical reactions occurring in different parts of the brain. Obviously, then, any complete explanation of brain function must utilize techniques for observing, measuring, and modifying the chemistry of selected brain sites.

For this purpose Delgado has developed "chemitrodes" (and "dialytrodes"), tiny, ingenious devices that permit, among other things, the injection and removal of minute but meticulously measured quantities of desired substances at specific locations. As with ESB devices, the dialytrode must be inserted under three-dimensional control, a neurosurgical technique known as stereotaxis. "With the dialytrode," says Delgado, "we have achieved a truly scientific way of looking at the chemistry of the brain. Traditionally, drugs are given orally and circulate through the whole body, bathing all the cells equally, despite the fact that only some of them need the drug. Now we can obviously be more selective, more precise, with consequently greater opportunities to arrive at useful treatments."

Delgado has already been able to treat certain selected patients—as have other brain investigators—by means of his various stimulation techniques. A case in point is Francisco, a 30-year-old telephone operator. A serious automobile accident left Francisco's arm paralyzed because of a shearing of his brachial plexus, a network of nerves supplying power to his left arm. Over the next several months, he began to experience pain that rose to intolerable levels. Finally, even high doses of narcotics failed to bring any relief. When neurosurgery was considered a last resort, the scientist proposed the insertion of his subcutaneous stimulator with four electrodes placed in two brain sites that prior experimentation in animals had shown to inhibit pain. After a period of study, Delgado's team located a cerebral point that, on stimulation, gave long-lasting relief from the pain, as well as the improvement of the depression Francisco had meanwhile developed. Intermittent stimulation was then directed over a period of several months solely to this one area.

Now, three years later, Francisco is back at work and remains free of pain. He is loath to have the transdermal stimulator removed—though he has not required further stimulation, and Delgado doubts that he will ever need it again.

APART FROM PAIN RELIEF, other potential medical applications of the still-ongoing research are in manic-depressive psychosis, epilepsy, and certain forms of episodic violent behavior that are postulated to be rooted in brain damage or disorder.

In addition, recent neurochemical research in Delgado's laboratory has demonstrated quantitative differences in the tendency for the brain cells of certain animals to "bind" addicting drugs—to hang onto them chemically—depending on whether the animals are raised in isolation or in groups. The "socially isolated" animal binds far more of the addictive chemicals, while at the same time it exhibits a lessened ability to relate to other animals and a tendency toward aggressive behavior. Dr. Francis Defeudis, the project's young director, has cautiously suggested that such studies may play an important role in unraveling the neurochemistry of drug addiction, with its accompanying social isolation and withdrawal.

To Delgado, the isolation experiments provide a perfect case in point for one of his key concepts—that the brain is a dynamic organ exquisitely responsive to the environment. If he is correct, such studies may ultimately do away with our traditional convention of separating environmental influences from genetic or biochemical ones. "We have demonstrated at the molecular level," he says, "that an environmental variant can actually change the makeup of the clinical reactivity of the brain cell."

THE IDEA OF THE BRAIN as changeable and therefore at least partially modifiable has obvious social implications. Brain research, to remain relevant, can-

## A Word About Psychochemistry

Because chemicals clearly play such an important role in brain function, particularly as *neurotransmitters*, it is not surprising that many compounds can affect the brain, causing changes in mental state and behavior. Countless drugs have been used, legally and illegally, to stimulate the lethargic, to calm the hyperactive, and to produce "altered states of consciousness." Such drugs as chlorpromazine, a tranquilizer that revolutionized the clinical care of schizophrenics, offer promise for the treatment of mental disease and a better understanding of normal behavior.

Substances that affect mood, thought, or behavior are termed *psychotropic* agents or *psychochemicals*. They include *tranquilizers*, such as valium; *sedatives*, such as barbiturates; *stimulants*, such as amphetamine ("speed"); and *hallucinogens*, such as LSD ("acid"). Our knowledge of the way these agents work is far from complete, but in some cases we can map out the brain parts involved and make some educated guesses about the processes responsible.

Experiments show that amphetamine interferes with the normal operation of a class of neurotransmitters called *catecholamines*, of which the most common are *dopamine* and *norepinephrine*. Neurons containing these substances seem to be confined largely to certain well-defined regions of the brain. Amphetamine forces such cells to release their transmitters; in some cases this can explain the drug's effects.



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not remain a detached scientific enterprise. It must—rather inevitably—begin, in Delgado's view, to touch on a host of social questions, such as nutrition, education, pollution. As one simple instance, nutritional deficiency in early infancy has been shown to cause irreversible stunting of brain growth, even if nutrition is improved at a later date. This cannot simply be set down as a "cold fact" of brain research; rather, it poses a social and moral challenge: how to guarantee adequate nutrition for every human being during the critical first few months of life?

"There seem to exist critical periods when the brain can be decisively influenced by environmental factors as diverse as the adequacy of the diet or the permissiveness of the schools," says Delgado. "One of our goals is to discover through research how our brains are 'molded,' how and why they respond as they do under different environments."

Awareness of the delicate interplay between the brain and the environment makes possible, Delgado believes, a new type of person—the "psychocivilized person." The "psychocivilized man or woman realizes that thoughts and personalities are dependent on culture and education (sensory inputs) *plus* the organization of the brain. Each person is in the middle of a feedback between emotions and feelings, on the one hand, and electrical, mechanical, and anatomical phenomena on the other. We now have the capacity to plan our future destiny by combining an awareness of our culture with an increasing knowledge of the supporting neurological mechanisms that define the limits of our behavior. Because our brains, as well as our cultures, can be modified, we now have the unique capacity to direct our own evolution. Instead of 'know thyself' we might be more appropriately encouraged to 'create thyself.'" □

# A Selection of Major Neuroscience Centers

**University of California, Los Angeles.** A large and diversified program with more than 100 scientists working on dozens of different aspects of brain function and behavior. Dr. John French, Brain Research Institute, UCLA, Los Angeles, Calif. 90024.

**University of California, San Diego.** A broad program with clinical concerns as well as basic research that often focuses on the brains of sea creatures. Dr. John S. O'Brien, Dept. of Neurosciences, UCSD, La Jolla, Calif. 92037.

**California Institute of Technology.** Research covers the range from messenger molecules of the brain to the different intellectual capabilities of the brain halves. Dr. Robert L. Sinsheimer, Laboratory for Behavioral Biology, Cal Tech, Pasadena, Calif. 91109.

**University of California, Irvine.** Dr. James L. McGaugh, Dept. of Psychobiology, UC, Irvine, Calif. 92664.

**Stanford University.** Dr. Eric M. Shooter, Dept. of Neuroscience, Stanford U., Stanford, Calif. 94305.

**University of Connecticut.** Dr. Benson E. Ginsburg, Dept. of Biobehavioral Sciences, U. of Conn., Storrs, Conn. 06268.

**Harvard University.** Research concerned largely with the function and interaction of individual brain cells. Dr. Torsten Wiesel, Dept. of Neurobiology, Harvard Medical School, 25 Shattuck St., Boston, Mass. 02115.

**University of Massachusetts.** One of the few programs to emphasize the theoretical aspects of neuroscience. Dr. Michael Arbib, Department of Computer and Information Science, U. of Mass., Amherst, Mass. 01002.

**University of Michigan.** Diversified program, with a large number of scientists dealing with both basic questions of brain function and the clinical problems of mental illness. Dr. Gardner C. Quarton, Mental Health Research Institute, U. of Mich., Ann Arbor, Mich. 48104.

**University of North Carolina.** Dr. Edward Perl, Program in Neurobiology, School of Medicine, UNC, Chapel Hill, N.C. 27514.

**Washington University.** Dr. W. Maxwell Cowan, Division of Neurobiology, Washington University School of Medicine, St. Louis, Mo. 63110.

**Society for Neuroscience.** An interdisciplinary organization of scientists concerned with research, education, and public information. Dr. Edward Evarts, 9650 Rockville Pike, Bethesda, Md. 20014.

**Columbia University.** A wide-ranging program looking at the ways brain-cell activity is involved in the behavior of organisms from snails to man. Dr. Eric R. Kandel, Division of Neurobiology and Behavior, CU, 630 W. 168th St., New York, N.Y. 10032.

**University of Florida.** Dr. Frederick A. King, Dept. of Neuroscience, U. of Fla. College of Medicine, Gainesville, Fla. 32601.

**University of Pennsylvania.** Dr. James M. Sprague, Institute of Neurological Sciences, U. of Pa. School of Medicine, Philadelphia, Pa. 19174.

**Albert Einstein College of Medicine.** Dr. Dominick P. Purpura, Dept. of Neuroscience, 1300 Morris Park Ave., Bronx, N.Y. 10461.

**Massachusetts Institute of Technology.** An unusually diversified and well-integrated program devoted to unearthing the biological roots of behavior. Dr. Hans-Lukas Teuber, Dept. of Psychology, MIT, Cambridge, Mass. 02139.

**University of Virginia.** Evolution of the brain receives special attention from neuroscientists here. Dr. Joseph Larner, Program in Neuroscience, U. of Va. School of Medicine, Charlottesville, Va. 22903.

**The Salk Institute.** The emphasis here is on the analysis of the chemical circuits of the brain concerned with such functions as pleasure, pain, and memory. Dr. Floyd E. Bloom, SI, La Jolla, Calif. 92037.

**Neurosciences Research Program.** An organization concerned with "facilitating the investigation of how the nervous system mediates behavior, including the mental processes of man." Dr. Frederick J. Worden, 165 Allandale St., Jamaica Plain Station, Boston, Mass. 02130.

**International Brain Research Organization.** An organization concerned with fostering international cooperation in brain research in tandem with WHO and UNESCO. Dr. Derek Richter, 41 Queens Gate, London, SW 7 5HU, England.

**Committee on Brain Sciences.** A forum for national issues related to the many aspects of brain research. National Research Council, National Academy of Sciences, 2101 Constitution Ave., Washington, D.C. 20418. □



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# Brain Damage: A Window on the Mind

## Researchers are turning brain injuries to advantage, using them as probes and indicators in studies on how the mind functions—and malfunctions.

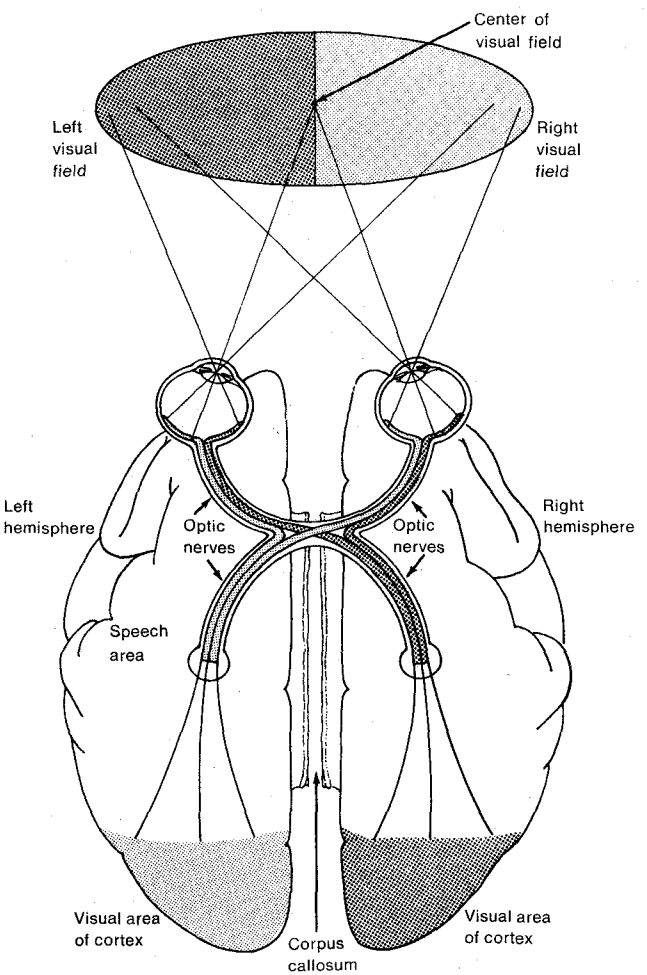
by Howard Gardner

Over the past decades our understanding of brain chemistry, of neural circuitry, of sensory and motor processes, has so increased as to render obsolete the medical textbooks of an earlier generation. But how much have these lines of neurological investigation—usually conducted with "lower" animals and dependent upon microscopic preparations—revealed about the functioning of the human mind? Can we draw from studies at the cellular level insights about those intellectual, emotional, and social capacities of pivotal importance within human society? In truth, it must be said: the gap between most work in the brain sciences and the elucidation of our own "higher functions" remains enormous.

Accumulating over the past century, however, has been an unexpected but highly revealing set of insights, one that illuminates precisely those functions central in human intellectual activity. From the careful study of normal individuals whose brains have been injured, we receive penetrating insights into the nature of such cerebral activities as reading, writing, speaking, drawing, doing mathematics, and making music. We can uncover the links—and the distances—between such activities. And we can gain fertile clues about those enigmas that have long intrigued both philosophers and laymen. What is the nature of memory? Can one think without language? Are all art forms cut from a single cloth?

An uncomfortably large number of circumstances can injure the adult brain, but by far the most common and—as it happens—the most revealing, is the cerebral vascular accident, or stroke. Each year, in this country alone, approximately 300,000 individuals suffer a stroke when blood vessels leading to their brains are occluded by deposits of fat, a clot lodges in an artery, or an artery bursts. These events threaten the loss of the two elements upon which the brain is crucially dependent: oxygen and glucose. Deprived of these precious substances for more than a few minutes and having no reservoirs upon which to draw, brain tissue is damaged or destroyed. And, once destroyed, it cannot be regenerated. Instead, one may await an unpalatable set of failures in those functions controlled by the brain cells: loss of motor and sensory capacities, failure of "high cognitive functions," and, perhaps, coma and death.

In the most fortunate cases, injury to the brain caused by a stroke may be so slight that it remains undetected; on other occasions, death or total disability occurs. But a sizable number of strokes each year prove to be of intermediate severity—insufficient to kill, yet virulent enough to affect permanently the individual's mental functioning. By what they can (and cannot) do, these unfortunate victims yield invaluable information to the neurologists, psychologists, and other scientists involved in the study of the brain.




From *The Split Brain in Man* by Michael S. Gazzaniga.
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*Visual and speech pathways—They can be disrupted in curiously selective ways by brain damage.*

WERE THE DESTRUCTION WROUGHT by a stroke, tumor, or head trauma completely general, so that all mental abilities were reduced by an equivalent proportion, little knowledge could be gained about the nature and organization of intellectual skills. (The victim would simply be a "dulled" normal individual; any insights gained from studying him might as readily be procured from the investigation of other normal individuals.) In fact, however, brain damage is highly selective. The victim may lose some abilities completely, while others remain wholly or virtually unaffected. An individual with a lesion in his left hemisphere may be completely unable to speak while remaining able to draw or hum with skill. An individual with a lesion in his right hemisphere may be unable to dress himself properly and may lose his way in the hospital while he can read and speak just as before.

As a result of these somewhat surprising circumstances, the brain-damaged patient constitutes a unique experiment in nature. What could never be done

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*Howard Gardner conducts research on the symbol-using skills of normal children and brain-damaged adults. He is author of* The Shattered Mind: The Person After Brain Damage *(Knopf, 1975).*



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experimentally occurs daily as a result of inexorable fate.

AS A NEUROPSYCHOLOGICAL researcher at the Aphasia Research Center of the Boston Veterans Administration Hospital, I have come to know several hundred victims of brain damage. Most of our patients are aphasic: their language abilities have been disrupted as a result of damage to the brain, such injury implicating their left cerebral cortex in nearly all cases. About one third of our patients suffer from other kinds of brain injury in other sites which, while sparing their language functions, vitiate other abilities. And so I have had the instructive opportunity of comparing the functioning of two kinds of patients—those whose language is impaired but who have retained other abilities and those who, while losing other capacities, retain the abilities to express themselves verbally and to understand spoken language. In what follows, then, I shall sketch some of the insights that other researchers and I have obtained from studying various brain injuries that may befall the normal adult.

One of the first lessons gleaned from work with brain-damaged patients is that common-sense notions of the relationships among abilities may be invalid. Take, for example, the set of symptoms encountered in a bizarre but not infrequent condition called *pure alexia without agraphia.* Patients afflicted with this disorder are unable to read text (they are alexic) yet remain able to write (they are not agraphic). One's immediate thought is that they must be in some sense blind; but in fact the patients can copy or trace out the very letters and words that they fail to read. To complicate the matter even further, the same patients are often able to read numbers. They may even read "DIX" as "509," while proving incapable of reading it as "diks." They are able to name objects but are frequently unable to name samples of colors shown to them.

On its own this syndrome confounds a raft of intuitions about how the mind works. Reading can be separated from writing; verbal symbols differ from numerical symbols; objects are named in a way different from colors. No one completely understands pure alexia, but the major facts of the syndrome described above have been repeatedly described and are widely accepted. Some researchers hold that the individual's visual powers and his verbal-language capacities are reasonably intact but that the connections between them have been disrupted. As a result purely visual configurations—like letters or colors—cannot be named (or read). But those visual configurations that arouse sensory or tactile associations (like objects or numbers) can be satisfactorily processed. Evidently, such findings not only undermine common sense; they also challenge the researcher to devise a model of mind that can account for this bizarre blend of abilities and disabilities. And they provide intriguing clues about why some normal individuals can master arithmetic before they can read or why others can more easily remember the names of rare objects than rare colors.

**"The brain-damaged patient constitutes a unique experiment in nature. What could never be done experimentally occurs daily as a result of inexorable fate."**

Pure alexia demonstrates that symbols which might have been thought similar (numbers and words) are processed in different ways by the brain. In a condition that accompanies injury to the parietal and occipital lobes of the left hemisphere, patients can understand single words and declarative sentences but fail to decode utterances that employ prepositional phrases like "on top of" or "next to," possessive constructions ("my brother's wife"), or the passive voice ("the lion was killed by the tiger"). Other syndromes demonstrate precisely the reverse situation; skills usually thought independent of one another in fact turn out to be closely related. Further investigations with these patients reveal difficulties in carrying out mathematical operations and in analyzing a spatial array. These disabilities co-occur with sufficient regularity to suggest that the same underlying "mental operations" may be drawn upon in understanding certain linguistic structures, in performing arithmetic, and in comprehending a spatial layout. And so, in this instance, the modeler of mental processes is challenged to unite skills that, on intuitive grounds, may appear quite unrelated. By the same token, the schoolteacher receives an impetus to use linguistic examples to aid mathematical understanding or to draw upon mathematical exercises in explicating the principles of grammar.

In most cases the deficits exhibited by brain-damaged patients are only too apparent, to the victim as well as to those who know him. Sometimes, however, a victim may be completely unaware of his deficits, and they may even escape the casual observer as well. An instructive example of this is Korsakoff's disease, a syndrome that results from damage to the mid-brain and is often the pathetic climax of many years of alcoholism.

The Korsakoff patient exhibits no evident physical disabilities. He may perform at an average or above average level on an intelligence test. He can solve a variety of problems posed to him; he can converse in an intelligent manner for hours. And yet, once his deficit has been revealed, it becomes painfully obvious. For a victim of Korsakoff's disease cannot remember anything that is told to him or anything that has happened to him since the onset of his disease.

FEW MEDICAL DEMONSTRATIONS are as powerful (and memorable) as that of Korsakoff's disease: one tells an apparently normal patient one's name, engages him in distracting conversation for a few moments, and then hears the patient not only claim ignorance of one's name but also deny that it has ever been told to him. Yet, if all memory were of a single piece, the mechanisms underlying this process would not be illuminated by Korsakoff's disease.

In fact, however, the Korsakoff patient *is* able to learn things providing only that one does not accept his testimony concerning what he knows. For instance, one can teach such a patient to play a new piece on the piano; the next day he will deny ever having learned the piece, but, once given the opening bars, he (or his fingers) will play the piece perfectly. One can teach a Korsakoff patient a complex new motor skill—say, solving a maze or copying an intricate pattern; once again, despite his sincere protestations of ignorance, the patient (or his hands) will reveal mastery of this new skill. And, most surprisingly of all, one can even teach such a patient a new line of verse, a nonsense slogan, or a series of answers to questions.

Such findings document at least two



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forms of memory. Given sufficient drill the brain of the Korsakoff patient can learn new patterns—motor, musical, even verbal—and can spew these patterns back under appropriate circumstances. But the Korsakoff patient has largely lost the ability to learn something new—particularly if it is verbal. And he is completely incapable of knowing what he has learned or of drawing upon such new skills in the voluntary way available to normal individuals.

The Korsakoff patient, finally, illuminates some of the quirks of our own mnemonic capacities: we can now better understand why we may be able to repeat a game, a motor activity, or a prayer that apparently had been forgotten; why a line of verse is more effortlessly retrieved when its meaning is ignored and its syllabic sequence is allowed to unfold without interruption; why a forgotten town becomes instantly familiar once we return to its environs; or why we can sometimes parrot back a recently heard phrase whose meaning has totally eluded us.

## Recent Publications in Neuroscience

*Chlorpromazine in Society: A Study of Therapeutic Innovation*, Judith P. Swazey, MIT Press, Cambridge, Mass., 1974.

*The Conscious Brain*, S.P.R. Rose, Knopf, N.Y., 1973.

*From Sad to Glad: Kline on Depression*, Nathan S. Kline, Putnam's, N.Y., 1974.

*How the Brain Works*, Leslie A. Hart, Basic Books, N.Y., 1975.

*Madness and the Brain*, Solomon H. Snyder, McGraw Hill, N.Y., 1974.

*The Brain Changers: Scientists and the New Mind Control*, Maya Pines, Harcourt Brace Jovanovich, N.Y., 1973.

*The Malnourished Mind*, Elie A. Shneour, Anchor Press, Garden City, N.Y., 1975.

*The Mystery of the Mind: A Critical Study of Consciousness and the Human Brain*, Wilder Penfield, Princeton University Press, Princeton, N.J., 1975.

*The Working Brain: An Introduction to Neuropsychology*, A. R. Luria, Basic Books, N.Y., 1973.

*Science and Epilepsy*, James L. O'Leary and Sidney Goldring, Raven Press, N.Y., 1975.

*The Shattered Mind*, Howard Gardner, Knopf, N.Y., 1975.

*Your Brain and Nerves*, J. Lawrence Pool, Scribner's, N.Y., 1973.

STUDY of the brain-damaged individual not only can illuminate the ordinary processes of ordinary individuals; it can also help to unravel highly developed skills possessed by talented individuals. Among the individuals who have proved extremely difficult to study under ordinary conditions are artists; such creative persons are few, are often unsympathetic to empirical investigators, and usually possess skills of such fluency that they defy dissection and analysis. Here, again, the accidents of brain damage offer a unique investigative opportunity.

Only on rare occasions has an artistically knowledgeable neurologist encountered an accomplished artist whose brain has been damaged. But from such rare happenings considerable insight has been gained into the operation of the artistic mind. Typically, painters can continue to create significant works after their language powers have been seriously disturbed; indeed, more than one researcher has claimed that visual artistry actually improves as a result of aphasia. But, interestingly enough, painters with right-hemisphere disease—whose language has remained unaffected—often exhibit bizarre patterns in the paintings: they may neglect the left side of the canvas, they may distort the external form of objects, or they may portray emotionally bizarre or even repulsive subject matter. Apparently, painting and linguistic capacities can exist independently of one another.

On the other hand, the relationship between linguistic and musical skills seems more complex. Some aphasic musicians prove able to compose or perform; some (among them the composer Maurice Ravel) have lost the ability to create musically even though their critical powers seem to be intact; still other musicians have been completely disabled by aphasia.

The striking individual differences found among brain-damaged musicians suggest that musical capacities may be organized in idiosyncratic ways across individuals. Perhaps most individuals learn in rather similar ways to speak and to draw, but the organization of music in the brain may differ dramatically depending on whether one has learned an instrument, what instrument one favors, whether one plays by ear, the extent to which one sings, and so on. No wonder that the preparation of musical exercises suitable for all students poses enormous challenges to even the most gifted and enterprising musical teacher!

Of the diverse conundrums that populate the area of human neuropsychology, none is more persistent and more endlessly fascinating than the relationship between language and thought. Opinions on this issue vary enormously. Some investigators (for example, those influenced by the American linguist Benjamin Lee Whorf) view all thought processes as shaped by language and consider aphasia the death of cognition. Other researchers (for instance, those influenced by the Swiss psychologist Jean Piaget) see language and thought as separate streams; they believe that thought can proceed in a virtually unimpaired manner despite a pronounced aphasia.

Dozens of studies inspired by this vexing question reveal quite clearly the inadequacy of both extreme positions. Unquestionably, certain cognitive and intellectual abilities depend quite heavily on linguistic intactness: the ability to reason about abstract issues, the capacity to solve scientific problems, and, in most cases, skill at mathematics. (Just try to think about a comparison between socialism and communism without resorting to words.) However, an equally impressive list details reasoning powers that may be well preserved despite a severe aphasia: the ability to solve spatial problems, sensitivity to fine differences in patterns or configurations, and alertness to the emotional contours of a situation. (Just try to describe a spiral staircase using only words.) And, though this area has not been much studied, it seems probable that an individual's sense of himself is not noticeably affected by linguistic impairment—even as "the self" can be decimated while linguistic powers remain completely unaffected.

WITH EVERY PASSING YEAR new neuropsychological laboratories are opened; virtually every issue of the leading journals documents fascinating new cases or pivotal experimental discoveries. Our knowledge of the skills detailed



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above, as well as many others not alluded to here, is certain to increase and to change. And yet it is already possible, on the basis of well-documented findings, to posit reasonably convincing models of human mental processes, particularly in the area of language. Moreover, it should be possible within the next decade to begin integrating what is known about relatively discrete cognitive functions—such as reading, memory, or visual recognition—with insights concerning such subtle and elusive areas as the individual's emotional life, his preferences and fears, his relations with other people, and, most intriguing of all, his consciousness of his own experiences and of the world about him.

Understanding the brain-damaged individual, and extrapolating to the normal person, is a worthwhile scientific endeavor in its own right. I do not at all wish to detract from it. However, work with the victims of brain damage provides both an opportunity and a challenge to aid these often hapless individuals. It is therefore encouraging to report that in the area of aphasia the increased understanding obtained from neuropsychological investigation has suggested some promising avenues of rehabilitation.

Once it had been established that skills in musical and visual tasks could be at least partially dissociated from linguistic skills, the possibility arose that such spared capacities might be marshalled to aid individuals in communicating with other persons. At our own unit novel forms of aphasia therapy have been desired for use with patients who have not benefited from traditional language therapy. The most successful of these new therapies, one devised by Martin Albert, Nancy Helm, and Robert Sparks, involves the use of singing (or melodic intonation) in order to aid the patient who is unable to express himself orally. A still-experimental therapy, developed in association with Edgar Zurif and several other investigators, involves the ordering of visual symbols drawn on index cards. Patients learn to associate these symbols with objects and actions in the world and then communicate their wishes and thoughts by manipulating the cards. Still other therapies, designed with the aphasic patient's strengths and limitations in mind, draw on sign language and on manipulation of an artificial speech synthesizer. It is still too early to pass final judgment on the efficacy of these therapies, but they at least offer hope that those areas of the brain that have been spared may to some extent be placed in the service of apparently destroyed functions.

BECAUSE THE PATIENT ordinarily studied by neuropsychologists was once normal, those parts of his brain that still function are presumed to reflect the way in which mental capacities are typically organized in the intact individual. In this respect he differs from the young child whose brain is much less differentiated into specific zones and, at the same time, is much more flexible. The adult with even a relatively small lesion may suffer permanent damage of major skills; the toddler can lose as much as half of his brain (via the removal of a hemisphere) and yet remain able to function quite effectively in intellectual matters, presumably because spared areas "take over" function.

**"Creative persons usually possess skills that defy dissection and analysis. Here again, the accidents of brain damage offer unique investigative opportunity."**

Despite these telling differences in brain organization and potential, knowledge about children's learning abilities and disabilities can be obtained from a study of the brain-damaged adult. In my view, the kinds of brain injury that befall adults often seem to reveal conditions found, perhaps in somewhat less clear-cut form, in schoolchildren with learning disabilities. For instance, individuals with acquired alexias (or reading disorders) often resemble children with dyslexia (otherwise-competent children exhibiting special difficulties in reading). Similarly, adult patients with selective disorders in calculation often resemble children who experience special difficulties in learning arithmetic. (Selective sparing may also prove illuminating: patients who can decode written symbols or who can repeat language without understanding resemble certain hyperlexic, autistic, or retarded youngsters.)

These clinical findings suggest that some children may be born with neurological abnormalities that yield the behavioral pattern found in certain normal adults whose brains have been injured. The rehabilitative clue here arises from the fact that the brain-damaged adult could once perform the now-disrupted function. Should one succeed in devising a way to "reactivate" this skill, using a channel that is as yet unimpaired, one might accomplish two goals. Even while aiding the adult in recovering an ability of importance, one has developed methods that may facilitate the acquisition of these same skills by the learning-disabled child. For one has developed an alternative-training regime that, while unnecessary for the completely normal child, may prove highly serviceable for the child with a slightly atypical brain.

RETURNING TO our original example of pure alexia without agraphia, one finds further applications of this procedure. Studies have documented that, if given three-dimensional letters to touch, alexic patients can read with greater skill. And, most intriguingly, studies of alexic patients in the Orient have revealed that they may be able to read ideographic characters while they fail to read phonetic characters. Just these insights have recently been drawn upon in the education of American children with selective disabilities in reading. Thus Paul Rozin and his colleagues at the University of Pennsylvania have developed an ideographic system effective with inner-city dyslexic children. And Jay Isgur, working with learning-disabled youngsters in Pensacola, Fla., has reported marked success in a program that builds upon the use of three-dimensional, "object-like" letters.

Whether such rehabilitative measures prove to be potent prosthetics, or of only marginal assistance, remains to be determined. Once destroyed, brain tissue is forever beyond repair, and the loss of this precious substance almost invariably involves serious cost. Yet, given that some brain damage is inevitable, and that transplants of neural protoplasm will not soon be with us, efforts to assist the injured child or adult must certainly be encouraged. And, indeed, such efforts constitute one of the most rewarding portions of research on brain damage. Even as insights into our own minds, and into mental processes generally, have been coming forth rapidly, it has proved possible to apply what has been learned to those individuals who, willingly if inadvertently, have contributed to our understanding. □



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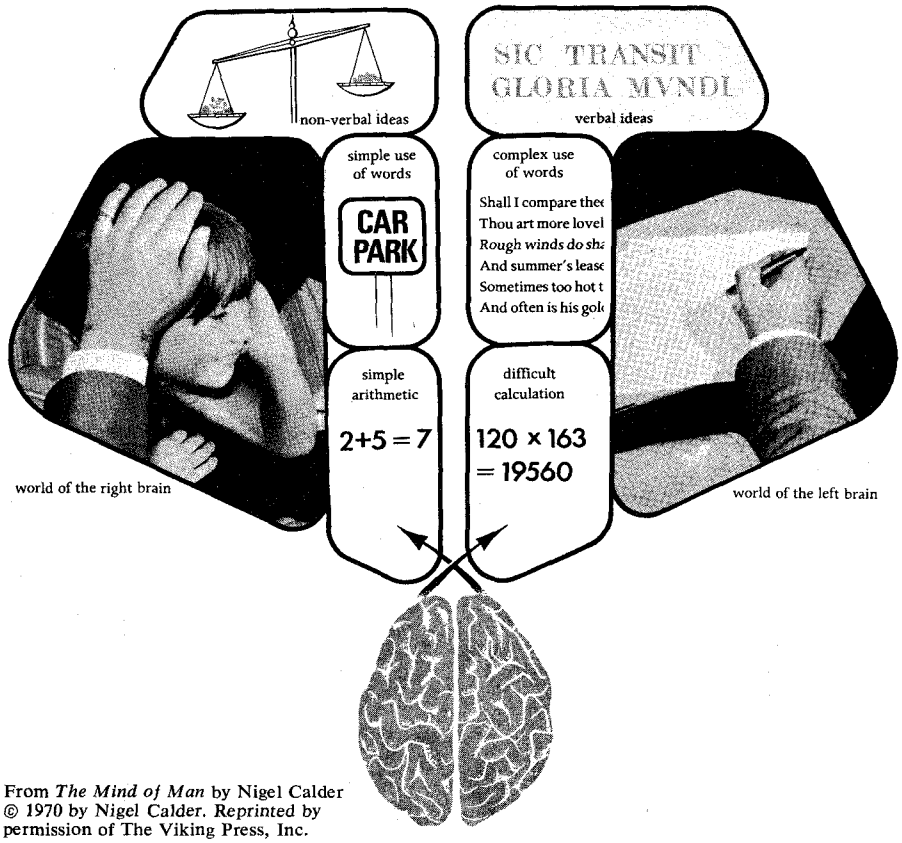


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*The two sides of the brain—When split, they act like separate persons.*

# Left-Brain, Right-Brain

## Our understanding of mind-brain interaction has been vastly altered by studies that now offer a clearer picture of the two brain hemispheres and their specialized forms of intellect.

by Roger W. Sperry

At the upper levels of the brain is a thick bundle of transverse fibers called the corpus callosum, the largest fiber system in the brain, interconnecting the brain's two large cerebral hemispheres. These hemispheres are now commonly known as left-brain, right-brain because, once the corpus callosum has been cut, the two sides of the brain appear to possess such independent capacities and mental properties that each merits a separate name.

The first series of operations creating the split brain in human beings was performed in the late Thirties and early Forties in order to relieve the seizures of persons afflicted with severe epilepsy —the theory being that the corpus callosum transmitted the brain waves which caused the seizures. The operation has proven effective for selected severe cases in minimizing seizures or in stopping them altogether. But the most remarkable effect of this drastic operation was the seeming *lack* of effect on the patient's behavior and personality.

Extensive follow-up studies failed to disclose any definite neurological or psychological symptoms or deficits left by the surgery. That was generally the case in occasional individuals born without a corpus callosum. As late as the early Fifties, the function of the corpus callosum—estimated to contain over 200 million fiber elements, was still an enigma.

This fact prompted my colleagues and me to undertake a series of laboratory studies on surgical sections of the corpus callosum of cats and monkeys. It soon became evident that the surgically disconnected halves of the brain have their own private sensations, percepts, and learning experiences—all cut off from the awareness of its partner hemisphere. We also learned that each brain half stored its own separate chain of memories, which were inaccessible to the other hemisphere.

The split-brained animal, having learned a task with one hemisphere, would have to relearn it all over again from the beginning when it was obliged to use its other hemisphere. Further, the two hemispheres could be trained concurrently to learn mutually contradictory solutions to a task—with no apparent mental conflict. It was as if each hemisphere had a mind of its own.

This finding still did not tell us much about the left-brain, right-brain differences in people, though, because it turns out that human beings are the only mammals whose left and right brains are specialized for quite different *functions*. This phenomenon is correlated with the power of speech and the related talents that separate us so distinctly from all other animals.

Our first opportunity to study a human split brain came in 1961, when a callosum-cutting operation was performed by Philip Vogel and Joseph Bogen of the White Memorial Medical Center in Los Angeles. The patient was a 48-year-old war veteran whose brain had been severely damaged by bomb fragments. The injury afflicted him with terrible convulsive seizures, which continued to worsen in spite of all treatment. Upon recovery from the surgery, he was free of the seizures and seemed quite normal in his everyday behavior; in fact, he even showed a much-improved sense of well-being. But his surface normality seemed to overlie some startling changes in his inner mental makeup—a suspicion we were to confirm in studies of additional subjects who had had the same operation.

Some of the new insights that evolved from these studies have occasioned an enormous burgeoning of interest in the left-brain, right-brain phenomenon—

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*Roger W. Sperry is Hixon Professor of Psychobiology at Cal Tech. This article is an edited adaptation of a speech Dr. Sperry gave upon receiving the twenty-ninth annual Passano Foundation Award.*



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among psychologists as well as biologists. In the process new concepts of consciousness and the workings of the human brain have emerged. Because of increasing public demands for relevance in government-funded science, I am often asked to spell out some of the more practical implications of our neuroscientific investigations in terms of medical perspective and changing views of man and the human mind.

But before I talk about left-brain, right-brain, I must go back a step or two. When we first launched our investigation into the functional role of brain connections, one of the first things we learned was how much we had to *un*learn. At that time neuroscience was thoroughly sold on the notion that brain function was infinitely malleable. Among other things, the functional interchangeability of nerves in neurosurgery was taken for granted. Having its "wires" crossed by the neurosurgeon supposedly created no problem at all for the brain back in the Thirties.

In those days if any damage was done to a nerve that normally transmits the necessary messages to, say, the muscles of the face, that nerve would be replaced surgically by a nearby healthy and more expendable nerve, such as the one used in lifting the shoulder. The initial effect would be that the face muscles would move whenever the patient tried to lift his shoulder. However, the doctrine of the day prescribed that if the patient went home and practiced in front of a mirror, those malleable brain centers would shortly undergo re-education to restore normal facial expression, now mediated through the brain centers and nerves designed for shoulder movement.

At the same time, efforts were being made to restore function to legs paralyzed by spinal-cord lesions. The technique involved using one of the main nerves of the *arm* without disconnecting that nerve from the brain centers. The arm nerve was dissected out, full-length, then tunneled under the skin, and connected to the leg nerves so that it would take over the function of the paralyzed limb. Only an early report of this procedure—*not* the final, disappointing outcome—appeared in the literature, for perhaps understandable reasons. Nevertheless, exactly the same operation was later (in the Thirties) reported to be a functional success in experimental tests with rats. The motor, the sensory, and even the reflex functions of a paralyzed hind limb were said to have been restored through the transplanted nerves (working via the brain centers) of the forelimb. Thus even scientists, trying to follow the most objective standards, now and then deceive themselves in the direction of their preconceptions.

In those days the nervous system was generally supposed to be possessed of a wholesale behavioral plasticity or, as one authority put it, "a colossal adaptation capacity almost without limit." The followers of Pavlov in Russia and John Watson in this country were speculating that it should be feasible to shape human nature into virtually any desirable mold and thus to create a more ideal society, by means of appropriate early training and conditioning.

This kind of thinking was reinforced by other views current in the Thirties. In particular, the prevalent doctrine concerning nerve growth told us that during embryonic, fetal, and early childhood development, fiber outgrowth and the formation of nerve connections in the brain were essentially diffuse and non-selective. That is, a nerve would connect as readily in one place as it would in another, as in any good standard household wiring system. There seemed to be no way by which the nerve circuits that governed behavior could be grown into the brain directly—that is, *pre*-functionally, through inheritance, without being shaped by experience. It was supposed that the adjustment in brain connections depended *entirely* on function and that it began during the earliest movements of the fetus *in utero,* continuing from then on through trial and error, conditioning, learning, experience, through any means but heredity. Our experimental findings in the Forties, however, effected a 180-degree about-face in our understanding of these matters. As we now know, nerves are *not* functionally interchangeable. The brain is not all that malleable, and the growth of nerve paths and nerve connections in the brain is anything but diffuse and non-selective. Neural circuits for behavior are definitely grown in, pre-functionally, *under genetic control*—and with great precision in an enormously complex, pre-programmed, biochemically controlled system.

This brief historical review is not just an excuse to recall old times. The point is that while all this has now become a matter of history for those of us in the biomedical sciences, the early views that became so deeply entrenched all through the Twenties, Thirties, and well into the Forties have still not been completely shaken off in other areas. The lingering aftereffect of these doctrines may still be found exerting an unwarranted influence on related disciplines, such as psychiatry, anthropology, and sociology, as well as on society at large. The result is that the majority of us still have a tendency to underrate the genetic and other innate factors in behavior.

**"Within the brain we pass conceptually in a single continuum from subnuclear particles, to molecules, to cells, to cerebral processes with consciousness."**

What dictates which hemisphere is dominant, whether the individual will be left-handed or right-handed? A recent theory put forth by Jerre Levy of the University of Pennsylvania and Thomas Nagylaki of the University of Wisconsin (both formerly at Cal Tech) proposes that there are two genes governing cerebral dominance and handedness. Each of these two genes has two versions, or "alleles"; thus there are four in all. One gene determines which hemisphere of the developing brain will be language-dominant, and a second gene determines whether the preferred hand will be on the same side as, or opposite, the language hemisphere. Without going into the details, if we count up the possible dominant and recessive characteristics contained in these few genes, we come up with nine different combinations of inherited genotypes, each with distinct properties of cerebral dominance and handedness. Some of the left-handers, for instance, will be more resistant than others to reversal by training, because of their genetic pattern.

Now, both the left and right hemispheres of the brain have been found to have their own specialized forms of intellect. The left is highly verbal and mathematical, performing with analytic, symbolic, computerlike, sequential logic. The right, by contrast, is spatial and mute, performing with a synthetic spatio-perceptual and mechanical kind of information processing that cannot yet be simulated by computers. When one is dealing with neurosurgical pa-



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tients whose left and right hemispheres have been surgically disconnected, it is most impressive and compelling to watch a subject solve a given problem like two different people in two consistently different ways, using two quite different strategies—depending on whether he is using his left or his right hemisphere.

In other words, the nine combinations of genotypes, representing different balancing and loadings of left and right mental factors, provide just in themselves quite a spectrum for inherent individuality in the structure of human intellect. Left-handers as a group have been shown to be different statistically from right-handers in their mental makeup—that is, in IQs and in other test profiles. Similarly, the profiles of males are different from those of females. And females masculinized *in utero* or those lacking one X chromosome are shown to be different from normal females.

Many kinds of tests have shown that the right hemisphere is particularly talented and superior to the left in visual-spatial abilities. This specialty of the so-called minor hemisphere, according to a recent report in the *American Journal of Human Genetics* by Darrell Bock of the University of Chicago and Donald Kolakowski of the University of Connecticut, is tied to a recessive sex-linked gene; that is, a gene linked to the X chromosome, of which the mother has two and the father has only one. In any case, the specialty is shown to exhibit a cross-correlation pattern of inheritance from parents to offspring in such a clear-cut manner that this aspect of cerebral dominance is seen to be purely genetic and other theories dealing with environment, experience, or child development as being responsible for it are ruled out. Because of the distinctly hu-

## Eyes Left! Eyes Right!

A simple but striking instance of the left-brain, right-brain dichotomy is the way it affects one's eye movements. The characteristic direction of these movements often yields interesting information about a person's attitude and ways of thinking.

To test this proposition, have someone look at you while you ask questions that might be handled by either brain hemisphere. Say, for example, "If you were President, how would you deal with the Middle East situation?" Or, "What is the meaning of the proverb, 'Better a bad peace than a good war'?" You will see that the subject's eyes glance (and frequently his head also turns) in one direction as he begins to reflect about the answer. Some look quickly to the left; others look first to the right. The direction of gaze of most persons is reasonably consistent (78 to 80 percent of the time in the same direction). The direction of this initial flickering shift, at the moment of pondering, permits one to classify people as "right-movers" or "left-movers."

What kinds of people glance to the left? Those who are more prone to focus on their internal subjective experiences. "Left-movers" are more readily hypnotizable, more likely to have been classical-humanistic majors in college, and are somewhat more likely to report clear visual imagery. It is significant to our understanding of creativity to note that the more readily hypnotizable person is one whose subjective experiences are rich, who accepts impulses from within, and who is capable of deep imaginative involvements.

Who are the right-movers? They tend to major in science or in "hard," quantitative subjects in college, and they are better at mathematical problems than in verbal ability. They are also quicker to identify concepts when the problem is based on words, as in this problem: "What adjective applies to the nouns—sky, ocean, eyes, jeans?"

What does the direction of a glance tell us about the way the brain functions? It implies a physiological bias—a pre-existing "set." One hemisphere is poised to act a fraction of a second before the other. In a sense, the connections of this half of the brain will take the lead in the person's psychophysiological functioning. When you consciously glance at an apple off to your left, you have an external object to look at, and it is activity within your right frontal lobe that causes your eyes to move to the left. But when there is no external target to look at deliberately, the glance is spontaneous, determined by internal factors. It is plausible to think, then, that when left-movers start their movement of internal reflection, they are revealing the greater facility in function within their right cerebral hemisphere. This bias in favor of the right hemisphere more readily activates the eye-movement system in their right frontal lobe and expresses itself in a quick, unconscious glance to the left.

How significant a glance may be as a clue to basic differences among persons in their temperaments, life-styles, and the way they create can, for the moment, be better imagined than defined, for the basic descriptive work is still going on, and much still needs to be done. Again, we see that an observation raises far more questions than it answers. But in the interim the issues raised illustrate the spectrum of decisions—subjective/objective, humanistic/scientific—that our two hemispheres make every day throughout many levels of creative thought.

A vast chorus of internal dialogue, verbal and non-verbal, embellishes our loosest associations as we dream, or focuses our concentrated attention when we are awake. Communication between the two hemispheres of the brain is essential if our creative efforts are to be well integrated in many dimensions: verbal and visual-spatial; internal and external; past, present, and future. Indeed, when the halves of the brain exchange their disparate experiences, pool their viewpoints and approaches, the resulting synthesis brings to problem solving a whole symphony of talents. The corpus callosum serves as the major thoroughfare rapidly transferring this information. Through it the left hemisphere speaks, quite literally, to the right, and the right hemisphere answers with its own repertoire of musical refrains, *sotto voce*.

Because the frontal, parietal, temporal, occipital, and limbic lobes of the brain are each paired, we begin to see the creative quest as the fusion of a major orchestral performance, with drum beats and clashing cymbals from all the more primitive deeper structures of the brain stem contributing their basic rhythm.

James H. Austin

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*James H. Austin is with the University of Colorado Medical Center. The above is condensed from a chapter of his forthcoming book,* Chase, Chance, and Creativity.



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man differences in left-brain, right-brain and the spectrum of variations that genetic inheritance makes possible in brain physiology—and *therefore* in temperament and talents—each individual brain is truly unique. The degree and kind of inherent individuality each of us carries around in his brain—in its surface features, its internal fiber organization, microstructure, and chemistry—would probably make those differences seen in facial features or in fingerprint patterns look relatively simple and crude by comparison.

A second message that emerges from the findings on hemispheric specialization is that our educational system and modern society generally (with its very heavy emphasis on communication and on early training in the three Rs) discriminates against one whole half of the brain. I refer, of course, to the non-verbal, non-mathematical minor hemisphere, which, we find, has its own perceptual, mechanical, and spatial mode of apprehension and reasoning. In our present school system, the attention given to the minor hemisphere of the brain is minimal compared with the training lavished on the left, or major, hemisphere.

A third and final message for social change that we get from the world of the laboratory is a complex one that precludes a simple summary. One of the more important things to come out of our brain research in recent years—from my standpoint, at least—is a greatly changed idea of the conscious mind and its relation to brain mechanism. The new interpretation, or reformulation, involves a direct break with long-established materialistic and behavioristic thinking, which has dominated neuroscience for many decades. Instead of dispensing with consciousness as just an "inner aspect" of the brain process, or as some passive "epiphenomenon" or other impotent by-product, as has been the custom, our present interpretation would make the conscious mind an integral part of the brain process itself and an essential constituent of the action. As a dynamic emergent property of cerebral excitation, subjective experience acquires causal potency and becomes a causal determinant in brain function. Although inseparably tied to the material brain process, it is something distinct and special in its own right, "different from and more than" its component physicochemical elements.

Its directive control influence is seen to reside in the universal power of the whole over its parts, in this case the power of high-order cerebral processes over their constituent neurochemical components. On these new terms, consciousness is put to work, given a use, and a reason for being and for having been evolved in a material world. Not only does the brain's physiology determine the mental effects, as has been generally agreed, but now, in addition, the emergent mental operations are conceived in turn to control the component neurophysiology through their higher organizational properties. The scheme provides a conceptual explanatory model for the interaction of mind with matter in terms that do not violate the principles of scientific explanation or those of modern neuroscience.

After more than 50 years of strict behaviorist avoidance of such terms as "mental imagery" and visual, verbal, auditory "images," in the past five years, these terms have come into wide usage as explanatory constructs in the literature on cognition, perception, and other higher functions.

The revised interpretation brings the conscious mind into the causal sequence in human decision making—and therefore into behavior generally—and thus back into the realm of experimental science from which it has long been excluded. This swing in psychology and neuroscience away from hard-core materialism and reductionism toward a new, more acceptable brand of mentalism tends now to restore to the scientific image of human nature some of the dignity, freedom, and other humanistic attributes of which it had been deprived by the behavioristic approach.

Old metaphysical dualisms and the seemingly irreconcilable paradoxes that formerly prevailed between the realities of inner experience on the one hand and those of experimental brain science on the other have become reconciled today in a single comprehensive and unifying view of mind, brain, and man in nature. Within the brain we pass conceptually in a single continuum from the brain's subnuclear particles on up (through atoms and molecules to cells and nerve-circuit systems without consciousness) to cerebral processes with consciousness.

When subjective values are conceived to have objective consequences in the brain, they no longer need be set off in a realm outside the domain of science. The old proposition that science deals with facts, not with values, and its corollary, that value judgments lie outside the realm of science, no longer apply in the new framework. Instead of separating science from values, the present interpretation (when all the various ramifications and logical implications are followed through) leads to a stand in which science becomes the best source, method, and authority for determining ultimate value and those ultimate ethical axioms and guideline beliefs to live and govern by. By the word *science*, I refer broadly to the knowledge, understanding, insight, and perspectives that come from science. But, more particularly, I am thinking of the principles for establishing validity and reliability and credibility of the scientific way as an approach to truth, insofar as the human brain can comprehend truth. □


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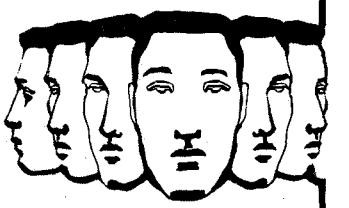

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# Failed Patriots

**Inside the Company: CIA Diary**
*by Philip Agee*
*Stonehill, 639 pp., $9.95*

Reviewed by Harrison E. Salisbury

So much has been written about the CIA in recent months that it is time to pause a moment and reflect on precisely what the Central Intelligence Agency is and how it got that way. There is a lesson in the origins and evolution of CIA that we must absorb if we are ever to cope with the critical problem it now presents. There is no point rushing into half-measures to try to "curb" the CIA if we do not comprehend the fundamentals of the problem. In this task, Philip Agee's comprehensive, often tedious, prolix, thoughtful, and remarkably illuminating study can be of great assistance.

CIA, it should be firmly stated, was not founded by evil men. It was not created as some kind of dark conspiracy to subvert American democracy. Quite the contrary, it was established by brilliant, intelligent, patriotic Americans who had accumulated substantial experience in intelligence and covert operations during World War II. Today's scandal is rooted in this very circumstance—the founding of the agency by men who won their spurs pulling off incredibly daring parachute entries into Norway, spiriting valuable scientists out of Nazi-occupied Europe, filching Nazi secrets out of the Wilhelmstrasse, and enlisting eccentric nationalists like Ho Chi Minh in the Allied war effort. The objective of these men, founders of the romantic, quixotic, remarkably successful OSS during World War II, was a simple one: to defeat the enemy—Nazi Germany, Fascist Italy, jingoist Japan. In war anything goes: the dirty trick, the criminal deceit, blackmail, torture, brute force.

When CIA was established in 1947, its basic cadres and leadership came almost intact from OSS. These men saw their objective in 1941 terms. Only now the enemy was the Soviet Union. It was not yet hot war, but the Cold War was far advanced. The Soviet Union and its presumed allies, Communists and Communist states wherever they might be, were an enemy precisely as deadly as Nazi Germany. Maybe more so.

When their task is conceived in these terms, what was more natural than that these clever, sophisticated, often unconventional men should seek to fight fire with fire? They knew, or thought they knew, a great deal about the Russians and the operations of their covert agencies and intelligence branches. The men of CIA set out to create an operation that could fight fire with fire—meet the Soviet intelligence networks, the KGB, and all the others on their own terms. If KGB bribed and subverted, so would CIA. If KGB had its execution teams, so would CIA. If KGB infiltrated democratic institutions, CIA would infiltrate Communist institutions. If KGB set up false-front organizations, so would CIA.

One has only to flip through the pages of Agee's book—only now released in this country because of earlier fears of CIA legal action—to see how successful CIA was in creating a mirror image of the Russian intelligence forces. In country after country, CIA penetrated the power structure of the local government, staged or encouraged coups d'état to put "reliable" men into power, bribed the press, falsified the news, manipulated local politicians, subverted elections.

And all of this, CIA and its leaders thought, was good. It was protecting America, protecting democracy, holding back the red wave of subversive Communist plotting that threatened to end our way of life. These words are clichés. The goal and thought of CIA was not. If the law had to be bent, if dirty hands had to be used, if scurrilous schemes had to be invented—these were all means to a noble end: the survival of the United States and the confusion of its enemies.

Keystone Press
*KGB bigwigs (and others) at Lenin's tomb*

How this was done Agee details in page after page. He was a lower-echelon agent working in Latin America, but reading his account one soon realizes that it makes no difference which country he happened to be working in, because the story was always the same: be alert against any manifestation from the Left; support the military and the dictators, for they are the only persons upon whom we can really rely—they can be bought and will stay bought.

Slowly the terrible truth begins to emerge: the men who fought KGB not only imitated and improved upon its methods; they began to *think* like KGB. Only in Russia, and only among the most hard-line Stalinists, have I heard the kind of reasoning that CIA employed to justify its terrible means. A process that only an Ionesco could depict began to occur. The loyal, thought-

*Harrison E. Salisbury is author of the forthcoming novel* The Gates of Hell, *a panoramic study of Russian life in the last half-century, to be published in October by Random House.*



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*in the Fifties—CIA men began to look and act like their Russian counterparts.*

ful, patriotic men of CIA began to look and act more and more like their counterparts—the ogres of KGB.

Gradually, even the goal of CIA began to disappear in the mirage of bureaucratic momentum. Its life as an ongoing institution became more important than the activities in which it was nominally engaged.

CIA did not really notice that thanks to its efforts America's "friends" around the world more and more became the antithesis of democracy—the military dictators of the Middle East; the purchasable colonels of Latin America; the Francos, the Salazars, the Shahs, the Chiang Kai-sheks, the shabby rulers of South Korea and South Vietnam. Without noticing, the CIA became more and more distrustful of the essentials of democracy—free choice, free speech, the democratic process. Our allies in Western Europe began to arouse concern. Were they really safe? What if a left-wing government came to power in France? Who could say whether the British Labor Party was *really* secure?

As Agee notes—and the point can be stressed again and again—the CIA by its charter is not an independent agency. It is an arm of the President. It can undertake *nothing* on its own. It is a secret pair of eyes, an extra daring pair of arms for the White House. It is the President's instrument, nothing more nor less. Congress from the beginning abdicated its responsibility to oversee, and that is the way the CIA wanted it and still wants it.

THE PRESIDENT, whoever he may be, thus cannot escape responsibility for CIA. If CIA murdered foreign leaders or plotted to murder them or provided logistics to murder them, the responsibility is the President's. The CIA is preeminently "The President's Men." They have no life or responsibility of their own.

The CIA policy of supporting corrupt, rotten, dictatorial, anti-democratic elements has now come home to roost. By aiding the suppression of normal political give-and-take and of normal growth in the political process, and by suppressing wherever possible any manifestations from the Left or procedures leading to social change, the CIA has created a situation in which violent change and violent revolution become almost inevitable in the "backward" countries of the world. If the lid is slammed shut on the pot too long, the pot will eventually explode. And this is precisely what CIA has brought about.

This situation can obviously not be cured by a new congressional "oversight" committee nor by any number of Rockefeller investigations. It can be cured only if Congress and the President comprehend that CIA must be their joint instrument in the furtherance of American policy, and if both work hand in hand to lay down guidelines which ensure that in fighting communism CIA does not succeed in destroying democracy at home as well as abroad. □

**ANSWER TO MIDDLETON DOUBLE-CROSTIC NO. 78**

ERIC SLOANE:
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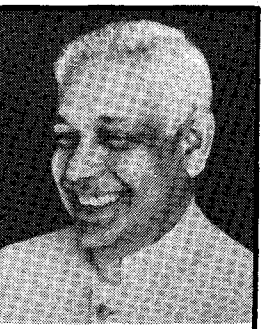

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# The House of Wharton

**Edith Wharton: A Biography**
*by R. W. B. Lewis*
*Harper & Row, 608 pp., $15*

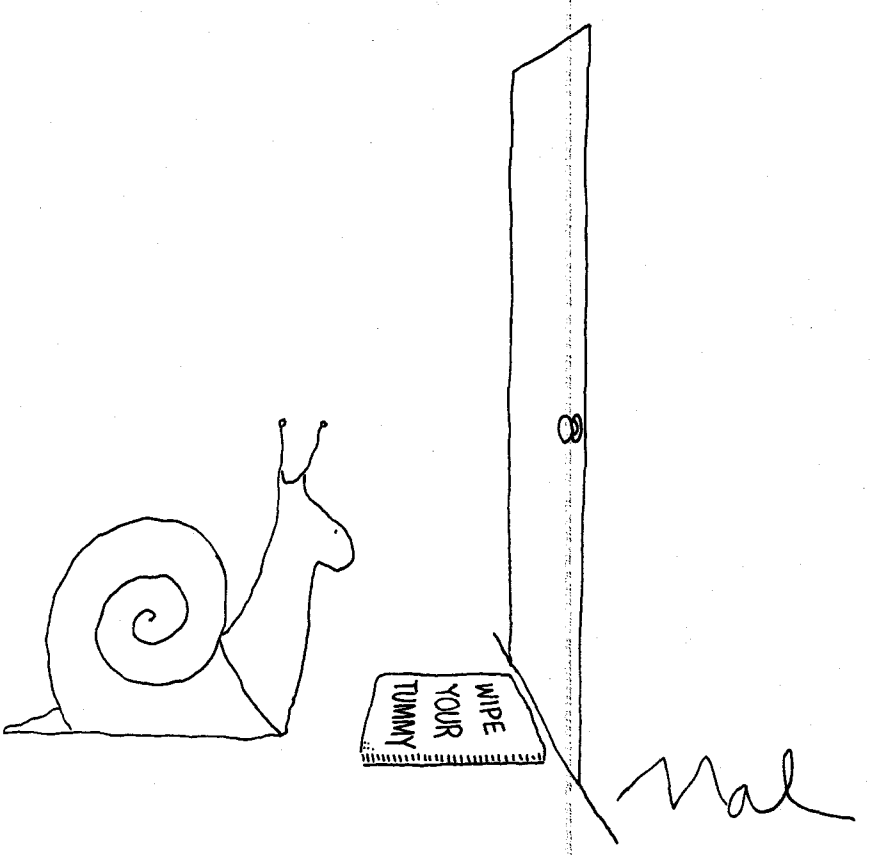
Reviewed by Robert F. Moss

It is not surprising that high society, which has played stepfather to so many creative artists via the "salon," has rarely sired any of its own. We are all familiar with those not-too-distant epochs in which the artist's life, glimpsed from a townhouse or a coach-and-four, seemed servile and inglorious. But even after Pope and Dr. Johnson—on the English front—had heroically demonstrated the potential self-sufficiency of the arts, and Dickens and others had gone on to make it a reality, members of the aristocracy were seldom drawn to creative professions, except to dabble occasionally. The hunger for recognition that supplies the artist's energies is understandably less common in an ambience where egos are sated from infancy by affluence and social prominence, and where intensity and dedication are rare. Even the most pleasure-seeking poet or composer cannot afford to betray the strenuous demands of his calling for very long.

High-born artists are, of course, not unknown, but they are usually apostates from their class. It is the willingness to forgo a significant measure of their aristocratic privileges that links such patrician geniuses as Tolstoy, Swinburne, Toulouse-Lautrec, and Rimski-Korsakov. American representation in this small corner of the pantheon is largely limited to Edith Wharton, although her precise relationship with other artist-aristocrats has been somewhat obscured by a scrappy, incomplete record. Fortunately, we now have a major biography, by R. W. B. Lewis, that assesses Mrs. Wharton's life and work.

Lewis, a respected scholar (*The American Adam*) and professor of English and American studies at Yale, confirms most of the raw data on Mrs. Wharton that was previously available: that she was born Edith Newbold Jones in New York in 1862, the daughter of wealthy, socially respected parents; that she grew up amidst the luxury of spacious homes in New York City and Newport; that she was a precocious child with strong literary and intellectual leanings; that in 1885 she locked herself into an unhappy marriage with ingratiating but empty-headed "Teddy" Wharton; that they were finally divorced in 1913; and that she spent the rest of her life abroad. Her literary reputation, commanding and lucrative, was secured with *The House of Mirth* (1905) and *Ethan Frome* (1911), and it reached its peak with the Pulitzer Prize–winning *The Age of Innocence* (1920). Despite enduring success, at the time of her death in 1937 she was regarded as something of a literary artifact.

This framework—call it the House of Wharton—has been filled over the years with numerous anecdotes, impressions, and attitudes, contributed by Mrs. Wharton's many friends. Naturally, Lewis strives to sweep out the dubious and the inauthentic and to replace them with his own perceptions and discoveries. For example, he effectively dispatches the gossipy rumor that Mrs. Wharton was an illegitimate child. His job is more difficult, however, when he tries to dislodge Percy Lubbock's memoir, *Portrait of Edith Wharton*, from its position at the center of all discussions of Wharton's personality. Lubbock's recollection of his old friend gives us, as Lewis says, a woman who is "too much of the *grande dame*, the aloof and fashionable woman of the world. . . ." But, exploiting the rich cache of unpublished diaries, journals, and letters to which he gained access in his research, Lewis is able to offer us a new Edith Wharton. In this incarnation she is a connoisseur of friendship, struggling to create a "republic of the spirit" among those she was most attached to: Bernhard Berenson and Henry James; Walter Berry, a cosmopolitan lawyer from her own immediate social set; Howard Sturgis, a millionaire's son with a cosmopolitan background and a taste for letters; Gaillard Lapsley, a well-to-do American who taught history at Cambridge; and Robert Norton, a well-bred Englishman with some political and esthetic hobbies. The testimony of these companions establishes Wharton's capacity for warmth and bonhomie. Lapsley admired her explosive laugh, observing, "What she loved above all was *fun*—the farce of life in its wildest and subtlest surprises. . . ." Norton felt her flaws were "obliterated by the big qualities of which one was always conscious. . . ." Although her unstinting work with Belgian refugees in




*Robert F. Moss is an assistant professor of English at Rutgers University.*



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Paris during World War I is a matter of public record (she received the Legion of Honor), Lewis rounds out the picture of her charitable side with several instances of private generosity.

MRS. WHARTON'S RELATIONSHIP with Henry James is an inevitable pendant to any consideration of their lives, jointly or individually. Within their unquestionable esteem for each other, Lewis locates some interesting pockets of tension. Particularly engrossing is the rattled, fearful tone James struck in his letters on anticipating a visit from the "Angel of Devastation," as he referred to her. Even allowing for the hyperbolical silliness that characterizes so much of James's correspondence, there is a genuine sense of intimidation in the face of this rich, domineering, energetic woman.

The most sensational feature of the new Edith Wharton is undoubtedly the heretofore unknown existence of a libido. Her contemporary image was that of a sexually repressed Puritan; it was hardly likely to clash much with the atmosphere of her fiction—where, in spite of rampant adultery, the sexual currents remain strictly an underground stream. Although there was a widespread assumption that Mrs. Wharton and Walter Berry were lovers, even her intimates seemed convinced that her erotic fires burned rather low. Wrong on both counts, asserts Lewis, who expels Berry from Mrs. Wharton's bed in favor of Morton Fullerton, an obscure American journalist whom the authoress knew in Paris. The more startling revelation, however, is the passion with which the refined Mrs. Wharton responded to Fullerton; it is graphically documented in her journal.

The new Edith Wharton that Lewis presents us with does not, however, supplant the old one; rather, the two coexist in the same person. Lewis is well aware of this coexistence. "No account of her," he declares, "should fail to say that she could be excessively demanding of those close to her . . . and humiliatingly curt . . . with strangers. She entertained prejudices that . . . one can only find regrettable." It is a contention easily verified by the text. Those who are not to the manner born will have difficulty sharing Mrs. Wharton's cruel impatience with the shyness of Cyril Connolly's wife, Jean, her outrage at the failure of an Italian hotel to align her bed just so, and her compulsion to tabulate the Parisian nobles she was able to befriend. Moreover, in the bruising conflict with her husband, Teddy—so pathetic, innocuous, and overmatched—the female seems indeed deadlier than the male.

Although Lewis is a forthright and candid source for all this information, he does not judge Mrs. Wharton as harshly as many of his readers may. For instance, Mrs. Wharton's evident greed and profligacy (she haggled with her editors endlessly over fees) does not seem to offend him much. He surveys the phenomenon with a bland remark about the "huge and steady expenses of her two estates" and the "ever-pressing list of her private charities."

RARELY has any literary biography taken us so directly into the world of rank and title, and the reader can see—even when Lewis cannot—how alien it was to the artist in Mrs. Wharton. In a most damaging way, it claimed a substantial portion of her mature personality, having inculcated its vanities, priorities, taboos. Instead of throwing off the narrow, crippling attitudes of Newport and Park Avenue, she sought a fusion of cultural sophistication with fashionable society. She found it—first in Paris, where the *haut monde* opened its salons and chateaus to her, and later in her intimate circle, in which elegant dilettantes like Howard Sturgis, Walter Berry, *et al.* easily outnumbered the Jameses and Berensons. Through it all Mrs. Wharton wrote steadily, with the wit and adroitness that Lewis ascribes to her, but without fully transcending her background. For all her vaunted sympathy for outcasts and victims—the poor butterflies broken on society's wheel—there is a rather facile acceptance of the codes by which the destruction takes place. The truth is that she was not enough of an outsider to the drawing rooms she analyzed to offer the sort of tough-minded critique that James, Proust, and Fitzgerald could. This is one of the deficiencies that keeps her fiction, even at its best, a level below theirs.

As to Lewis's treatment of Mrs. Wharton's *oeuvre* itself, he is, not unexpectedly, most absorbed by the autobiographical dimension. Like other commentators on Mrs. Wharton's writing, he quickly and persuasively demonstrates that her marital miseries formed the underpinning of most of her work. The inflexibility of societal codes, the entrapment of the individual by his social circumstances, the inevitable failure of extramarital options—these were the themes her imagination chiefly fed on. Lewis bucks the critical consensus on much of Wharton's work, arguing intelligently that novels such as *The Custom of the Country* (1913) and the unfinished *The Buccaneers* (1938) have been unjustly ignored or dismissed as the tired gasps of an enfeebled talent.

Lewis's study, then, is doubly valuable. It provides an array of fresh reflections on Edith Wharton, while also allowing the reader to draw some conclusions that Lewis himself does not. Exhaustive in its scholarship, discerning in its literary judgments, sensible in its theorizing, it merits the adjective all biographies aspire to: *definitive.* □

FRASER YOUNG
LITERARY CRYPT NO. 39

*A cryptogram is writing in cipher. Every letter is part of a code that remains constant throughout the puzzle.* *Answer on page 54.*

CFGWG HWG DGSDEG
BFS RS HWWHXUG
CFGMW EMQGR CFHC
CFGI NGGV CFGLRGEQGR
SXEI SX RMVG VMRFGR.
—SWCGUH I UHRRGC

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# Desert Diocese

**Lamy of Santa Fe**
*by Paul Horgan*
*Farrar, Straus & Giroux, 523 pp., $15*

Reviewed by Larry L. King

In mid-1839 a 25-year-old rookie priest, Juan Bautista Lamy, left his native France for the wilds of America to begin missionary work in rural Ohio; when he died, in 1888, he was the revered archbishop of Santa Fe and at one time had served a vast frontier extending from 30 miles east of El Paso, Tex., to California. The prolific Paul Horgan has once again drawn upon his scholarship of the American Southwest in writing the first full-length biography of a man who overcame delicate health, wars, strange languages, economic depressions, pioneer hardships, and rebellious subordinates to spread the Catholic word in an alien and often hostile environment.

Father Lamy and his boyhood chum Joseph Machebeuf, who would remain his lifelong confidant and aide–himself becoming bishop of Colorado–packed more adventures into their lives than one might expect of a troop of soldiers of fortune. They became, by sheer necessity, expert horsemen and plainsmen, hunters and guides of wagon trains, emergency physicians and carpenters, politicians and traders, diplomats without portfolio and lawmen without guns. In their special ways they "tamed" more bad towns and villains than did the legendary Matt Dillons and Wyatt Earps. One comes away astonished at the remarkable perseverance and lifelong energies of the two padres.

Originally working under the bishop of Cincinnati, and with only a halting command of the English language, they came to a land where "at the time there was lively animosity against Catholics, who kept arriving by immigration from abroad in swelling numbers–people mostly of the laboring class come to make their fortunes and find new identity in republican America." They preached in forest clearings, orchards, and rude log huts; by their living examples they patiently knocked down the fears and misrepresentations brought to play against their faith. Walking 20 to 30 miles almost daily, until able to afford mounts, they ministered to Danville, Zanesville, Newark, Massillon, and lesser villages. Sometimes "it was so cold that ink froze in its bottle" as they wrote or studied English by firelight; often they slept against their horses for warmth. Compared with later happenings, however, they were enjoying a picnic.

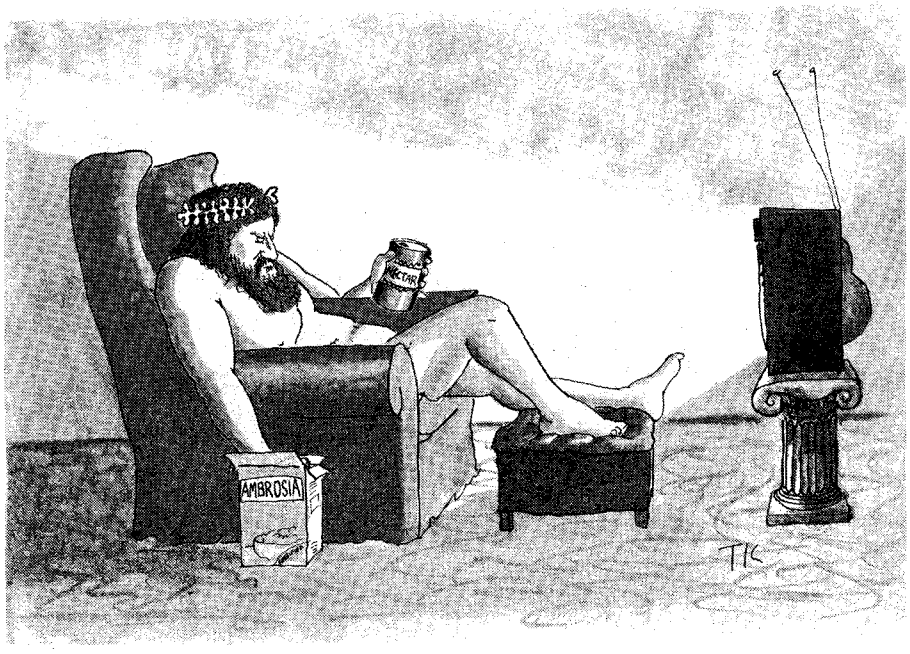
By 1850, when the 36-year-old Father Lamy was startled to learn that Rome had named him bishop of Santa Fe in the New Mexico Territory, the two friends had established dozens of churches and schools in Ohio and Kentucky. Invoking a youthful pact they had made never to be separated, Lamy persuaded Machebeuf to follow him west as his vicar-general.

The church had special problems in the American Southwest following the 1846 war with Mexico. The Vatican, working from ill-defined and outdated maps (and with little appreciation for the varied cultural differences of the New World), erred time and again in ruling on jurisdictional disputes after new political boundaries–often vague and inexact–had been drawn. "All lands that had been ceded [to the United States] had been administered by bishops of Mexico," Horgan writes. "What should now be decided? Should this, could this, old ecclesiastical authority continue, even across national boundaries?" Rome, originally deciding that Mexican bishops should remain in control of new U.S. territories, inadvertently caused years of legal wrangling. Father Lamy would spend much of his life in answering the challenges of subordinates stubbornly loyal to the bishop of Durango, Mexico.

Lamy made a triumphant entry into Santa Fe (though not before a shipwreck off the Texas Gulf Coast destroyed all goods and possessions purchased for his new station), only to discover that powerful priests of the territory refused to recognize him until signaled by the bishop of Durango. Their motives were not entirely selfless. Indeed, Lamy had been assigned to the territory after Rome discovered that its reigning agents were known for drunkenness, exorbitant charges for conducting church rituals, open adultery, keeping loose records, and giving indifferent performances. Bishop Zubiria of Durango, 1,500 miles away, in Mexico, had visited his distant parishes only three times in 20 years.

Unable to control his maverick priests despite warnings and punishments, Bishop Lamy made a 3,000-mile round-trip journey by horseback to settle the jurisdictional dispute. Though Bishop Zubiria seemingly bowed to Lamy's papal documents, a boundary dispute soon brought new animosities. Father Ortiz, rural dean of Santa Fe, and Father Gallegos of Albuquerque enlisted the support of old cronies, including wealthy ranchers and the area's "first families"–who were resentful of outsiders–to make bureaucratic, political, and legal war. Given the almost unbelievable number of churches, schools, and general revitalizations accomplished by future Archbishop Lamy and the trusted Father Machebeuf, the mind boggles at how effective they might have proved if they had not so often been required to justify themselves to Rome by letters,

*Larry L. King is a journalist, novelist, columnist, and teacher.*



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by emissaries, and even by personal trips abroad.

Their personal meanderings to recruit new missionaries, raise money for their work, and attend to the faithful exposed them to cholera epidemics, extreme weather, and Indian attacks, in addition to the slow attritions of age. Each time they returned to Santa Fe there were new challenges requiring suspensions or other disciplinary actions, including—in the case of priests at Taos and Arroyo Hondo — explosive excommunications. Even the Congress of the United States, to say nothing of the Vatican, became embroiled in the controversies. The two of them more than survived.

PAUL HORGAN'S ENERGIES in researching and interviewing for this book appear almost to match those of his subjects. To tell the truth, he told me more about them than I needed to know. Apparently not wishing the existing letters and documents of the period to go to waste, he has included repetitious matter and incidents so trivial as to make the eyes beg relief. This is not a book suitable for the seashore or the swing: no summer reading, this.

There are nuggets, yes, in this endless mine of a book that probably will be of more interest to the Catholic pious than to others; it's just that one grows weary of digging them out. For those willing to make the effort, there are rewarding glimpses of nineteenth-century America, of church politics, of man's unconquerable soul, and of man's petty vanities and incredible varieties. □

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WIT TWISTER NO. 52

Edited by Arthur Swan

*The object of the game is to complete the poem by thinking of one word whose letters, when rearranged, will yield the appropriate word for each series of blanks. Each dash within a blank corresponds to a letter of the word. Answers on page 54.*

The star flings the ____,
but misses her aim.
Now insults ____ from
the film mogul's frame:
"It's time for a ____,
dear. I'm tired and you're sick.
"We'll film you through gauze, and
we'll make you up thick.
"But don't expect surgeons with
____ and thread
"To make you look ____
when beauty has fled."

Contributed by Col. Myron Birnbaum, Falls Church, Va.


*Is there really starvation in America?*

*There sure is.*

*And there would be more of it except for the NAACP Emergency Relief Fund.*

*There's Elma May Greer.* Since her husband died, she's been trying to support eight children on $84 a month from welfare.

*Join Ray Wood's family for dinner.* When he can't pick up any day labor, his $25-a-month veteran's disability pension has to feed all 11 of them.

*Try budgeting Berlean Fairley's* $60 a month to cover lights, gas, food and shoes for four growing kids.

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Through volunteers working out of local NAACP branches, we provide the cash—and sometimes the carfare—that makes food stamps available to the Greers and Woods and Fairleys.

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# Fragments of Truth

**A Word Child**
*by Iris Murdoch*
*Viking, 400 pp., $8.95*

Reviewed by Bruce Allen

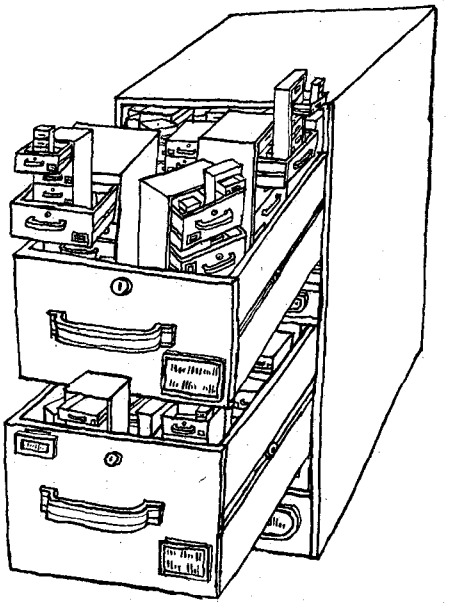
Iris Murdoch's densely woven, dramatic new novel—her seventeenth in 21 years—may well bring forth the usual lamentations over her perverse failure to create believable characters and her odd preference for convoluted, ridiculous assortments of people stuck together in outrageous relationships. But this novel *is* different, though a logical outgrowth of her earlier books. (Murdoch readers know how she tends to use the conclusion of one novel as the motivating impulses in its successor.)

The novel's protagonist and narrator is—like the usual Murdoch hero—a man in thrall to a defining illusion. "I mourned and mourned about the destruction of my hopes," Hilary Burde confesses. In his youth Burde committed a great wrong, which he is sure has ruined his life, irreparably. And although later occurrences suggest his possible redemption, hence salvation (it is Murdoch herself who emphasizes these, and other, Christian terms), Hilary's original pessimism appears finally to be confirmed. At the novel's conclusion we must wonder which is the illusion: the optimist's belief that we can atone for our crimes and outlive them or the nihilist's certainty (Hilary expresses it) that people are doomed, despite their good intentions, to whirl eternally in a muddle of "penitence, remorse, resentment, violence, and hate."

If Hilary Burde's name suggests a frivolous gravity or a burden lightly borne, that is a cruel joke, as are the facts of his pain-filled life. Hilary emerged triumphantly from illegitimacy and poverty, in a rural northern England boyhood. Encouraged to develop his gift for languages, he reached as far as Oxford, but was compelled to "resign his fellowship" after causing the death of another man's wife. Years later, in the midst of his "small and nasty" life chained to a dreary civil servant's job, ensconced in a shabby London flat, Hilary—the man to whom words are the only reality—fends off the efforts of well-meaning meddlers to make him *communicate*. That word keeps recurring. So does Hilary's persistent, compulsively verbalized moaning over his fate ("I hated the universe. . . . I had a cosmic furious permanent sense of myself as victimized").

Enclosed in bitterness, he accepts only the consolations of unvarying routine. He visits the same people on the same weekdays (the novel's five-to-six-week span is divided among Hilary's designated "days" with his host of varied acquaintances). The only scenes that lighten his gloom are ones which assault Hilary's concentration on his own central importance, and which rouse up his resistance to "communicating."

The lemming-like scramble toward communication is dramatized in the unrehearsed meetings, attempts to *touch* and *love*, that occupy the energies of this novel's other characters. To Hilary, they are all incidental absurdities, nastily encroaching on the borders of his personal, stage-commanding drama. There is his sister, Crystal, frizzy-haired and docile, barely literate. ("She's full of biblical lore. It's all she knows.") Arthur Fisch, Crystal's timorous suitor, waits selflessly for her, hoping for Hilary's "permission." Gunnar Jopling, the wronged man from Hilary's past, resurfaces alarmingly; an unpredictable further catalyst emerges in Gunnar's second wife, Lady Kitty.



It is Crystal and Gunnar who grow to an independent power that makes them more than simple communicants in Hilary's passionate quest to purify himself. The patient spinster rejects her Arthur, not out of quiet devotion to Hilary (as he imagines), but in obedience to the demands of a buried emotional life far deeper than he can believe her capable of possessing. Gunnar Jopling, destroyed but vibrating with revengeful energy, poses a baffling challenge for his chastened injurer: if Hilary can reach Gunnar, "touch" him, and soothe old wounds, then the dreamed-of redemption may loom nearer. . . .

SUGGESTIVE SYMBOLS and symbol-patterns are woven into the action with Murdoch's usual virtuosity. Tommy—sometimes patronized as "Thomas"—*doubts* Hilary's gruff lovelessness. "Gunnar" suggests an Aryan or Scandinavian king. His wife is titled, and Hilary makes himself the "instrument" of her will. His quest for lost innocence possesses chivalric elements, and it is the stubbornly decent Arthur who voices simple ethical absolutes, begging Hilary to submerge his ego in the performance of good deeds. Arthur is *Arthur*, and *Fisch*—it seems almost superfluous to add that the fish is a traditional symbol for Christ.

There is a clearer symbolic pattern in the figure that poses a dramatic antithesis to the "word child" Hilary is: the frequently evoked figure of Peter Pan—whose story will be the matter of this year's Christmas pantomime at Hilary's office, and whose statue (in a London park) mischievously overlooks several of Hilary's secret assignations.

Does the clever, guileful boy lead the way toward a fairyland-like retreat from a self-torturing life that need never have been lived at all? I'm not sure whether the book's chilling final scene portends Hilary's redemption or leaves him still the bearer of an egocentric barrenness that will continue to blight and destroy. Hilary thinks of himself, ruefully, as "a man destined to vanish." I think Murdoch makes it clear that he will outlast us all.

The best answer to the charge that Iris Murdoch cannot create individual characters may be that she rejects the notion of the individual's primacy. All the people who collide and hurt one another throughout this novel scratch out small, partial fragments of the world's

*A free-lance writer and critic, Bruce Allen lives in Kittery, Maine, and frequently contributes to these pages.*



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whole truth. In this rich, allusive, elusive romance—one of the best novels she has ever written—Iris Murdoch shows how the individual's inward concentration on himself is stultifying and death-producing; more important, she is demonstrating how the worship of the individual sensibility is a trap for the creative writer and a dangerous betrayal of the truth the best writers keep looking for. □

# New Books

### Light Years

*by James Salter*
*Random House, 308 pp., $7.95*

Someday someone is bound to produce a study of the failed marriage as portrayed in contemporary American writing. There is certainly a wealth of material to draw on—hundreds of novels, short stories, stage plays, screenplays, and teleplays focusing on miserable, battling couples. It is to James Salter's credit that in his new novel he treats a familiar subject in a not altogether familiar manner. The story of Viri and his wife, Nedra, of their gradual parting, their divorce and its aftermath, is told in a series of short, carefully drawn scenes. As the scenes accumulate, we see that Viri and Nedra are simply going through the paces of married life: habit has, unfortunately, replaced need. Salter renders their world in sparse, suggestive prose, as he expands an account of an unsuccessful marriage into a story about commitment, habit, and change.

Salter goes wrong, however, in his choice of protagonists. Viri and Nedra are simply not interesting or complex enough to warrant all the space he devotes to them. Viri is an architect who hasn't achieved the fame he desires. He worships the Spanish architect Gaudí and admires (rather incredibly) the plays of the Spanish writer Valle-Inclán. Nedra, who certainly lives comfortably enough, would like more comfort. She shops at Bonwit's and Bloomingdale's, lunches at the Museum of Modern Art, and reads Alma Mahler. The couple leave their house on the Hudson and try to find themselves in Paris and Rome. Salter frequently attempts to give dramatic weight and urgency to rather prosaic moments by intensifying his language, but he seems to be merely inflating the ordinary. Though he tries to make the problems of Viri and Nedra important to us, and though he sometimes succeeds, too often their dissatisfaction comes across as chic despair.

RONALD DE FEO

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### Memoirs of a Man—Grenville Clark

*Collected by Mary Clark Dimond*
*Edited by Norman Cousins and J. Garry Clifford*
*Norton, 319 pp., $10*

John Cowles, Sr., principal owner and editor of the Minneapolis *Star* and *Tribune*, said to friends one night in 1952: "I regard Grenville Clark as one of the greatest—if not the greatest living American—but most people do not even recognize his name." Indeed, when friends tried to get the Nobel Peace Prize for him in 1967, wave after wave of impressive endorsements and second-the-nominations flooded the Oslo committee from every corner of the democratic world. But the deadline ran until January 31 of that year. On January 13 "Grenny" Clark was dead at 84. No Nobel Peace Prize was awarded in 1967.

Grenville Clark was one of the founders of a famous law firm, in which Elihu Root, Jr., and Francis W. Bird, Jr., were partners. All three had been classmates at Harvard Law, and all three were scions of illustrious fathers and forebears. The firm was established in 1912, and for the rest of his life Grenville Clark was a distinguished and tenacious lawyer. But it was as champion of world peace and civil rights, with special interest in minority groups, that Mr. Clark became famous. If the United Nations ever comes to grips with the requirements of world peace through enforceable world law, Grenville Clark's name should be on the scroll, for he left behind a thoroughly feasible and practical plan for a world without war through a United Nations with teeth and substance.

This volume is written about Grenny Clark by some threescore friends and associates whose observations fall into such categories as portraits, legal friendships, civil rights, educational friendships, family friends and neighbors, world peace; there is a final segment of important letters written by him to Teddy Roosevelt, Wendell Willkie, Harry Truman, John F. Kennedy, and others in places of power. W. Averell Harriman believes Mr. Clark deserved the title "World Patriot." John J. McCloy says "G.C." possessed an indomitable urge "to advance the progress of man toward the light." James B. Conant, Kingman


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Brewster, Jr., and John S. Dickey find him a formidable mind and an operator extraordinary in education. Paul Dudley White, Norman Cousins, Lewis W. Douglas, Lewis B. Hershey, and others remember him as a perfectly delightful fellow with a one-track mind—to be a champion of world peace. I. A. Richards, Stringfellow Barr, and Carlos P. Romulo tell why he was such an impressive performer before San Francisco and later. Romulo says of him: "There will not be another Grenville Clark," which seems to be the prevailing memory of an extraordinary man.

Alan Cranston probably sums it up best with a 2,000-year-old quote from Lao-tzu: "A leader is best when people barely know that he exists." It is really astonishing that so much of the good this man did—and will do through a strengthened United Nations in generations to come—was done in what amounted to obscurity during his lifetime, now properly publicized for the first time. I wish I'd known him.

RICHARD L. TOBIN

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## Tongues of Fallen Angels

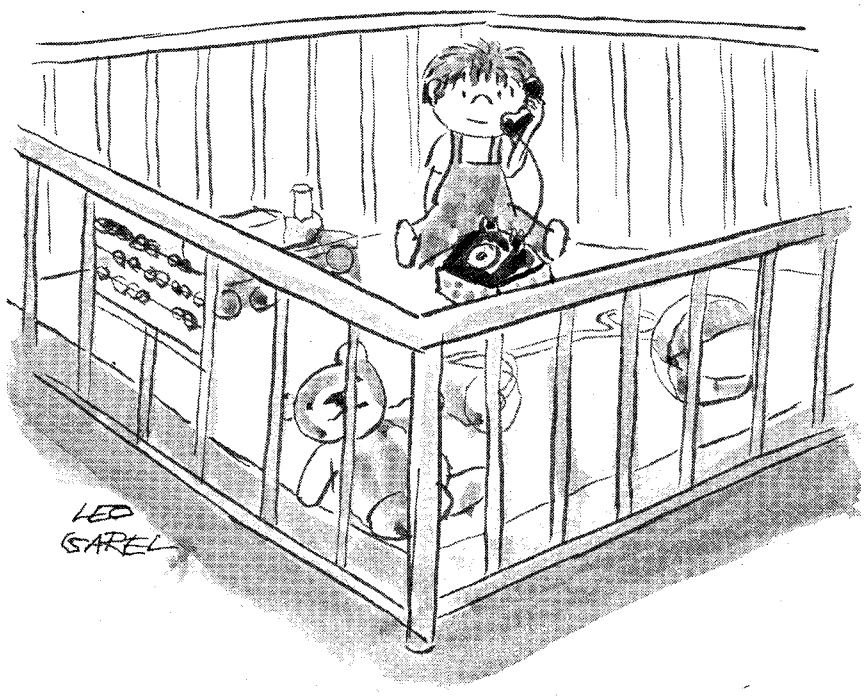
*by Selden Rodman*
*New Directions, 271 pp., $12*

In writing up his conversations with the 12 writers included here, Selden Rodman has set himself a difficult task: to preserve the flavor and substance of long, wide-ranging talks with members of a notoriously wily and secretive species. Working without the aid of a tape recorder or extensive notes, Rodman was motivated by his conviction that the spoken words of Neruda, Borges, Hemingway, and others would be as interesting and as important as their works. Ironically, he has produced a gossipy, fast-paced book that proves almost the opposite: to judge by the evidence presented here, writers off duty are only rarely more profound than, say, veterinarians.

Perhaps we shouldn't mind. As long as pearls flow from their pens, what difference does it make what comes out of their mouths? And yet it's hard not to cringe mentally when Allen Ginsberg informs us that "in India it's true that more people suffer poverty, but the earth is still funky," or when Norman Mailer defines "existential" as "like when you don't know how something will turn out." When not tripping over their tongues, Rodman's fallen angels tend to trip over their egos, delivering oral reviews of themselves full of statements such as, "It was a seminal book in my development as a poet." (The American writers are the chief offenders here; for whatever reason, the South Americans seem to take their fame more calmly.)

If Rodman were not so clearly a charitable and earnest person, one might almost suspect him of intentionally providing his subjects with enough rope to hang themselves. As it is, one can't help feeling glad that Keats, Dickens, and the rest are beyond the temptation provided by his all-too-generously accorded attention.

KATHA POLLITT




*". . . and everywhere that Mary went the lamb was sure to go . . . this is a recording."*

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## Consenting Adult

*by Laura Z. Hobson*
*Doubleday, 256 pp., $7.95*

The publication, in 1947, of *Gentleman's Agreement* was a milestone in the history of American anti-Semitism, or at least in the popular awareness of it. The book, and the much-acclaimed movie made from it, touched sensibilities, made people aware, and sometimes ashamed, of their feelings. Perhaps some of them resolved to act differently, no matter what they thought privately.

In any case, anti-Semitism has weakened considerably in the last 28 years, as have some of our other prejudices. In her new book, however, Mrs. Hobson tackles the bigotry that Middle America now finds most justified, indeed to the point of fervor—that against homosexuality. Otherwise-tolerant men freely admit their contempt for and hatred of "faggots," and the fear of a son's homosexuality is virtually intolerable to fathers.

The father in this novel is almost literally crippled by the discovery of his boy's "tendencies." Already weakened by a heart attack, Ken Lynn becomes a sort of zombie, unable to face the boy, unable to be a husband to his wife. What Mrs. Hobson is showing us is that Mr. Lynn is emasculated not by the discovery, but by his own puniness, his inability to put the unstrained quality of fatherly love above training and prejudice.

Tessa Lynn copes better, not because of a more flexible feminine nature, but, interestingly, because she has a reasonable and intellectual mind. Her way of coming to terms with the enormous and painful fact of her son's homosexuality is to submerge herself in supporting facts. Haunting the library, she becomes, in time, an expert on homosexuality, an informed researcher. With knowledge comes acceptance and understanding, and in the end it is Tessa who, growing through suffering, has become a "consenting adult." This is her story, and it should, once again, force readers to examine their own feelings.

CERRULIA KENT



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# Trade Winds

by William Cole

### Pilot Poet

Reading this column regularly, you may get the idea that *all* poets are teachers. Not so. Here's young David McElroy, whose first book, *Making It Simple*, comes from Ecco/Viking the first of September at $6.95. At the moment he's a bush pilot in Alaska, and he's been a smoke jumper there and in Guatemala. His poems are adventurous, too—witty, intricate, surprising. He'll go so far as to create a simile and follow it with "(get it?)"—that's relaxed! When not adventuring, he lives in Seattle with his wife, Colleen, who is a well-known black poet. Here's the only short poem in the book, "Ode to a Dead Dodge":

> Now corn pushes past the foam-
> rubber front seat where it sprouted,
> pale and aiming like a drunk for the light
> up front where glass and guessing
> became concrete. One ear taps
> code on a dud horn.
>
> The corn drives on, gunning till fall
> the engine, which, as it now stands,
> is a sumac, V crotch in the stem,
> four-barreled leaves doing the job
> while all around hang those red fuzzy
> berries. Very good, I've heard, for tea.

### Want Never to End

There's a rare kind of book that you want never to end. I think of two in recent years: *Enid Bagnold's Autobiography* (Atlantic/Little Brown, $8.95) and *What the Woman Lived: Selected Letters of Louise Bogan* (Harcourt Brace Jovanovich, $14.50). And now let's add one: *The Great Railway Bazaar: By Train Through Asia* by erstwhile novelist Paul Theroux (Houghton Mifflin, August 22, $10). I give it my gold-plated guarantee. It's not so warmly wise as the aforementioned two, but it's heroically funny, intriguingly informative, and delightfully shocking. What Theroux did was set out from London, alone, take the Orient Express to Istanbul, then switch to other glamorous (and sometimes odious) trains for a four-month trip through Asia, coming home via the Trans-Siberia. He's the best kind of traveler—doesn't waste his time with ruins and churches, but is fascinated by people. And what a marvelous bunch he met! Rogues, simpletons, paranoids, and just plain folks. India and Japan were the most frustrating countries, Vietnam the most beautiful. There are enough anecdotes to fill a reference book. Here's an English fellow traveler going through Switzerland: "He looked out at the Alps. He said, 'They say if the Swiss had designed these mountains, um, they'd be rather flatter.' " He notes that many, many Sikhs are members of Lions Club International: "This is partly a cultural misunderstanding, since all Sikhs bear the surname Singh, which means lion; they feel obliged to join." I could quote and quote, but here's a scene in Calcutta:

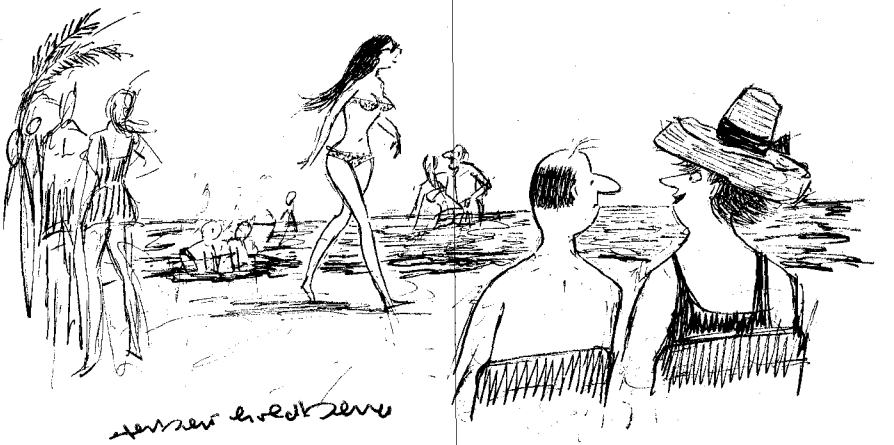
> I was on my way when I saw the hopping man in the crowd on Chowringhee. He was very strange: in a city of mutilated people only the truly monstrous looked odd. This man had one leg—the other was amputated at the thigh—but he did not carry a crutch. He had a greasy bundle in one hand. He hopped past me with his mouth open, pumping his shoulders. I went after him, and he turned into Middleton Street, hopping very fast on one muscular leg, like a man on a pogo stick, his head rising above the crowd, then descending into it. I couldn't run because of the other people, black darting clerks, swamis with umbrellas, armless beggars working their stumps at me, women proffering drugged babies, strolling families, men seeming to block the sidewalk with their wide flapping trousers and swinging arms. The hopping man was in the distance. I gained on him—I saw his head clearly—then lost him. On one leg he had outrun me, so I never found out how he did it. But afterwards, whenever I thought of India, I saw him—hop, hop, hop—moving nimbly through those millions.

### Inside

Book publishing has its own "inside" prize. Each year since 1942, *Publishers Weekly*, which should know, gives an award for "a distinguished project in book publishing." It's called the Carey-Thomas Award, named after two American publishing pioneers. It's gone over the years to H. L. Mencken's *The American Language*; *The Diary of George Templeton Strong*, edited by Allan Nevins and Milton H. Thomas; Princeton's Bollingen Series; and that publishing—magnifying glass project *The Compact Edition of the Oxford English Dictionary*. This year the judges have just given the nod to McGraw-Hill for *The Madrid Codices of Leonardo da Vinci* and *The Unknown Leonardo*.

### Paper Pleasures

With a perversity of my own, I've always wanted to have a hyena as a pet. Now here's a book says they make nice ones: they're somewhat rough and boisterous, but affectionate and intelligent. *Hyaena* by Hans Kruuk (Oxford, August 7, $7.95) is a picture-text book about the darlings. Oh, yes, they occasionally eat babies and old people, and they're rather greedy—sometimes eating over 30 pounds of meat at one sitting—but they're not the slinking and stinking creatures we usually think they are . . . The frisbee, as we know it today, evolved from the pie plates of the Frisbie Pie Company in Bridgeport, Conn. Yale students took to scaling them about. So we're told in the definitive book *Frisbee* by Dr. Stancil E. D. Johnson (Workman, $4.95). Anything you could want to know: games, photos of Grand Masters, diagrams and drawings of grips and catches, how-to-play-with-your-dog, and so on. Not to be tossed aside lightly. . . . A couple of wags at *Esquire* have come up with *Sneaky Feats*, subtitled *The Art of Showing Off and 53 Ways to Do It*, by Tom Ferrell and Lee Eisenberg (Sheed & Ward, $2.75 paper). Cutting a deck with one hand, making a cat's cradle, whistling with a blade of grass, shadow pictures. Ebullient. □



*"It's the age of permissiveness, Joel; take a look."*



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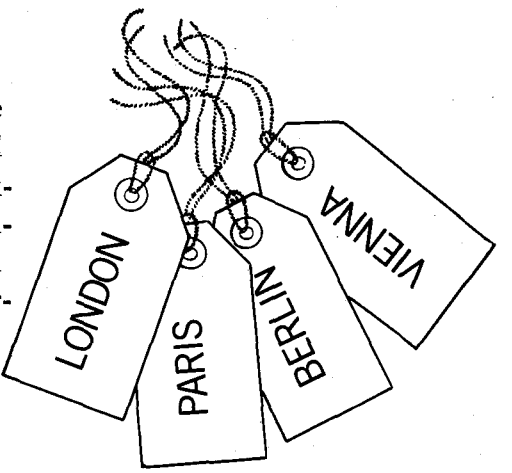


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# artsletter

Prepared in cooperation with the National Society of Literature and the Arts.

NATIONAL ENDOWMENT FUNDING GOES TO SENATE. The $82 million appropriation for fiscal 1976, requested by the National Endowment for the Arts (see Artsletter, June 28), has been reduced to $79.5 million by a House of Representatives appropriations subcommittee. This reduction is in line with other congressional actions on 1976 budgets and is not regarded as in any way reflecting dissatisfaction with the Endowment's performance. A vote on this issue is expected this summer. The House normally acts on appropriations before the Senate. Nancy Hanks, chairwoman of the NEA, has told Artsletter that she intends to ask the Senate for restoration of the originally requested funds if the House reduction remains in effect.

NEW GROWTH INDUSTRY? Panels, commissions, and forums on the arts are proliferating so fast these days as almost to constitute a new American growth industry. The latest investigation to be announced is a $250,000 project headed by David Rockefeller, Jr. (34-year-old son of Chase Manhattan's chairman), which aims to lay groundwork for strengthening the role of the arts in education. A 23-member panel of educators, businessmen, arts administrators, and artists (including NSLA board member James Michener) will endeavor to determine "what needs to be done, how best to accomplish it, and what priorities should be assigned to the last quarter of the century for the arts in education." According to Rockefeller, "what we're talking about is as important to education generally as reading. All of the arts are in language forms, but in the schools we're only teaching writing." A report on the panel's findings is due in autumn 1976.

DEPT. OF CORPORATE LARGESS. An unprecedented series of 16 or more one-hour TV specials entitled "Dance in America" will be broadcast monthly over the PBS network beginning next January. Exxon Corporation, the National Endowment for the Arts, and the Corporation for Public Broadcasting are each contributing $500,000 to the first phase of the project. Negotiations are now under way with major American dance companies, choreographers, and television directors . . . Later this month the New York Philharmonic, under its musical director Pierre Boulez, will begin a three-week tour of Europe, playing 18 concerts in 14 cities, from Edinburgh to Chartres by way of Belgium, Switzerland, and Germany. The tour was made possible by a grant (amount undisclosed) from IBM.

PUBLISHING CUTBACKS. Although book publishers have generally weathered the present recession without severe problems, it is apparent that purse strings are beginning to tighten. Prime casualties are first novels and collections by new poets. These have always been published at a loss or break-even, except for the occasional title that hits the bull's-eye, but today--with production costs at a record high--publishers are less and less inclined to risk capital on ventures that confer prestige but no profit. Doubleday reports that books of poetry now show an average loss of $10,000 to $15,000 per title. As a result, the firm will be publishing only four new poets a year instead of the previous eight. Harper & Row, Viking, and Swallow Press are also cutting back on new poetry.

First novels have been declining in number for some time. Unless the buildup for a new novel generates extraordinary advance interest, booksellers are reluctant to place an order--even though the publisher or wholesaler allows them to return unsold copies for full refund. In the past publishers could launch a good deal of marginal fiction, despite the adverse hardcover economics, because of income generated from the sale of subsidiary rights to paperback houses and,



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occasionally, film producers. But paperback publishers are also becoming more choosy, and that means less subsidiary-rights money to offset the first novelist's red ink.

The conventional wisdom among book publishers is that the market has been glutted with dubious merchandise and that the new stringencies will not affect writers of real talent. Perhaps. But if new novels or poems can't see the light of print, it will be hard to say whether or not they were "worth" publishing.

ARTISTS FROM ABROAD. A major exhibition of American "immigrant artists" will be on view at Washington's new Hirshhorn Museum next year from May to October. Its purpose: to assess the impact of foreign-born artists on American culture and, vice versa, the impact of America on their work. The exhibitions will be drawn from museums and private collections throughout the country, and artists will include Joseph Stella, Hans Hofmann, Marcel Duchamp, Ben Shahn, Willem de Kooning, and Saul Steinberg.

MUSIC BRIEFS. At a meeting in Florence, the International Association of Opera Directors--including representatives from Chicago Lyric Opera, New York City Opera, and San Francisco Opera--voted to freeze fees to singers, conductors, directors, and set designers for the next three years. Just how that decision can be made to stick wasn't revealed. Our guess is that if Birgit Nilsson wants a raise, she'll get it . . . After more than a half-century of association with RCA Records (or its parent company, Victor), violinist Jascha Heifetz has switched allegiance to Columbia. His first record under the new auspices--a "live" recital given in 1972--will be out in the fall . . . With a grant from the Ford Foundation, eight Americans will soon go to Hungary to study the highly regarded principles of music teaching promulgated by the late Zoltán Kodály. The trainees will later teach in the New Haven school system, which will serve as a national model for Kodály music programs . . . Admirers of Dietrich Fischer-Dieskau, Germany's celebrated baritone, have long wondered when he would undertake the role of Hans Sachs in Wagner's Die Meistersinger. The answer: this coming season at West Berlin's Deutsche Oper.

NEW WRINKLES IN ENDOWMENT LEGISLATION. Omnibus legislation to extend the National Endowments for the Arts and Humanities for another four years (see Artsletter, June 28) has been introduced by Rep. John Brademas and Sen. Claiborne Pell. Included in the reauthorization bill is a proposed "Museum Services Act." It calls for the establishment of an Institute of Museum Services to help museums in many ways, including direct subsidy for day-to-day operations. An annual authorization of $30 million in federal funds is envisaged. (The bill also calls for a federal program of indemnification covering exhibitions brought to the United States from foreign countries.) Another amendment in the Brademas-Pell bill proposes that 4 percent of the funds authorized for the Arts Endowment be specifically earmarked for the American Film Institute.

If the bill were to pass in its present suggested form, it would probably mean that the National Endowments would no longer directly include films or museums in their granting programs, and they would have no programmatic control over funds appropriated. Some experts argue that this would be an improvement, that perhaps every art form ought to exercise direct control through an administrative structure which reflects the concerns of institutions. Others argue that by watering down the control of the Endowments a competitive situation is created which forces organizations within each art form to be politically active all the time. Either way, the issue will be much debated in the next few months, and the eventual outcome could significantly affect our cultural future. Artsletter will keep members informed of developments.

ARTSLETTER is prepared in cooperation with the National Society of Literature and the Arts, 488 Madison Avenue, New York, N.Y. 10022.



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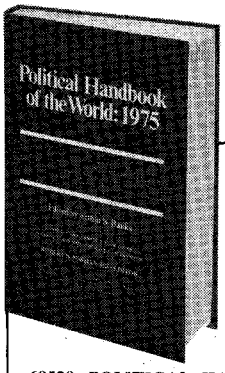


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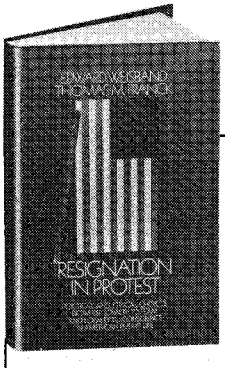


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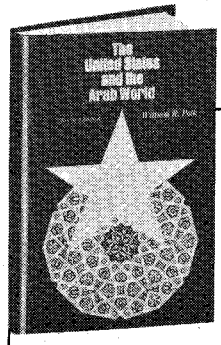


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(**India:** *continued from page 11.*)
that these things could not be done—and the law had to be changed. When known smugglers who have played havoc with our economic life are arrested, the law comes to their rescue. The laws of evidence rest upon Blackstone's maxim that it is better that 10 guilty persons escape than that one innocent man should suffer. But we find that as the law is administered, more often than not, it makes the innocent suffer and lets off the guilty. We have to remedy this situation. Millions are waiting for social justice and for the law to be speedier and less expensive.

In short, India has to do a better job of upgrading the living conditions of its people and improving the quality of life. It needs to grow more food, produce more goods, provide better education, strengthen its social services, carry out land reform. In all these respects, I have heard it said that the only way these things could be done was by dissolving our democratic institutions and installing the kind of authoritarian regime that stifles all freedom. In fact, it is widely believed that large democratic societies in the world today are unworkable, and that the only countries which can meet all their needs are the authoritarian nations.

I disagree profoundly with such an analysis. I have always believed that an open society could develop the sense of unity and purpose and discipline that would enable it to rise to whatever heights are necessary.

I do not believe that a democratic society has the obligation to acquiesce in its own dissolution. I do not believe that a democratic society need be defenseless against those who would paralyze it. I do not believe that a democratic society cannot take strong measures to deal with its foes, from within or without.

The American people are getting ready to observe their Bicentennial year. During that year much attention will be paid to the American Founding Fathers. We, too, have our Founding Fathers. They were wise enough, when they wrote our Constitution, to provide for extraordinary situations, as well as to define the limits of government authority in dealing with such situations. This government has made essential use of that authority and is staying within those limits.

*What response can be given to the statement that the prime minister over-reacted because of sensitivity to criticism?*

**Mrs. Gandhi:** Can you name a single person who has been subjected to such a sustained campaign of calumny, in Parliament and outside, and who has taken it with equanimity? I have not even lost my temper! Had I been hypersensitive, would I not have reacted much earlier? But I knew the motives of those who attacked me.

The restrictions that have been imposed on the press are primarily for preventing incitement of the public. With regard to foreign reporters, can they claim extraterritorial rights in India and exemption from laws that apply to our own citizens?

A section of the world press has always belittled India and her actions and misrepresented what is done here. While my father was alive, there was an attempt by a small section of Indians and Americans to describe him as anti-American. The same charge is now being made against me—that I am unfriendly to America. You know that this accusation is far from the truth. I admire the American people. We seek friendship from all, but we are not subservient to any country. Isn't it odd that most of those who seem so concerned about democracy in India have been applauding China and other countries which have authoritarian governments?

*Do you consider your actions inconsistent with the ideas of Jawaharlal Nehru?*

**Mrs. Gandhi:** I do not feel I have acted in a manner that negates his beliefs. Would Jawaharlal Nehru have sat and watched the country disintegrate?

I did not become prime minister in order to dismantle a structure of self-government and freedom that my father, Jawaharlal Nehru, and millions of others like him labored so painstakingly over so many years to construct. Those who know me would find it ludicrous to believe that I would want to be known in history as the person who defeated the most cherished hopes of Jawaharlal Nehru for the Indian people. Nor do I want to be known as a government leader who lacked the will to act decisively when the legacy of Mahatma Gandhi and Jawaharlal Nehru was blocked or threatened.

*What do you plan to do in the event of an adverse Court ruling?*

**Mrs. Gandhi:** My appeal will be heard by the Supreme Court. It would not be right to speculate on what the Court will say. I do not wish to say anything about my case except to draw your attention to the fact that at the time of the 1971 elections, the government in Uttar Pradesh was an opposition one and that the minister in charge of the police (he supervised the building of the rostrum) not only was from Rae Bareli but also was the election agent of Mr. Raj Narain, my opponent.

*How soon will the emergency be over? Do you anticipate that Jayaprakash Narayan and other political figures who have been interned will be released soon?*

**Mrs. Gandhi:** As soon as we are assured that they will not endanger the situation and that they will renounce the threat of extra-constitutional direct action. I hope that normalcy will return not only in the sense that the country will be reasonably free of incidents but also in the sense that there will be less anger and greater self-control.

I know that some people are saying that the measures we have been taking will never be revoked and that India can look forward to a totalitarian future. I can understand their concern, but I say to them that India is not now—nor do I have any intention of letting it become—a totalitarian society. The same Indian Constitution that gave the government the authority to take emergency measures also limits the duration of the emergency controls. Also, the president of India has the authority, when Parliament convenes, to order the presence of any members of Parliament.

I do not expect, however, that the present emergency situation will be unduly prolonged. We are doing what we have to do to get the country moving and to face up to our problems. The signs right now are good. Some improvement has already taken place in our economy, especially on the marketplace level. Prices are coming down. Black marketeers no longer flourish. Foodstuffs and merchandise are increasing in supply. Paradoxically, some people see this progress in negative terms. They believe that the only way progress can be maintained is through an indefinite extension of the emergency. Those people are as wrong as those who felt India could drift aimlessly into an improved economic condition. We will not allow economic progress to become a reason for perpetuating the emergency. □



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# Diversions

by Leo Rosten

## Fearless Facts About the Bible

It always astonishes me to learn how little even religious folk know about the Bible. (I am no less unhinged by how little brilliant agnostics know.) And so, *ad majorem Dei gloriam,* I offer a quick cram course for the woefully uninformed.

(1) The Old Testament was not written in Latin, Greek, or even Sanskrit. It was written in Hebrew—with some passages in Aramaic.

(2) The New Testament was not written in Hebrew, Aramaic, or English. It was written in Greek.

(3) The original manuscripts of the Old Testament, and the Gospels and Epistles, were long thought to have been lost forever—simply worn out by use down the centuries. But in 1947 the Book of Isaiah (except for two small parts) was discovered, by a boy, in a cave northwest of the Dead Sea. The priceless parchment had been wrapped in yards of cloth, covered with pitch, and hidden in an earthenware jar. The experts agree that this treasure was written during the first century B.C.—at least 1,000 years before the oldest previously known manuscript of any book of the Bible.

(4) Since 1947, several more biblical manuscripts have been discovered; they are even older than the Dead Sea scrolls.

(5) The Holy Book was first *printed* between 1450 and 1456 in Mainz, Germany, from the movable type devised by Johann Gutenberg (whose real name was Gensfleisch). This Bible was printed in Latin, from a contemporary Vulgate edition. The Vulgate was a Latin translation of the scriptures by St. Jerome (mostly) in the fourth century, and it became the standard Bible used in the services of the Roman Catholic church.

(6) Scholars believe that 40 to 50 copies of the Gutenberg Bible still exist, but only three perfect copies are known. (One is in the Library of Congress.)

(7) The first Bible printed in America appeared in 1663, published for the benefit of the startled Indians of Massachusetts. The Good Book was translated into their language (which I do not know) by an unsung missionary named John Eliot.

(8) The Old Testament contains 39 books, 929 chapters, and 23,214 verses. The New Testament contains 27 books, 260 chapters, and 7,959 verses.

(9) Not until 1250 was the Bible divided into chapters (by a cardinal); not until 1551 was the New Testament divided into verses (by a French printer).

(10) The first Bible to use both chapters and verse numbers was the Geneva Bible of 1560. The power and cachet of precedence is seen in the fact that Bibles published today still use the chapter and verse divisions of 1560.

(11) Every year the Holy Scriptures are translated into new languages. Portions (at least) of the Bible have been published in 1,431 languages. This number represents about 97 percent of the tongues spoken by the Babelian populations of the world. You can now read the Scriptures in Igala, Setswana, Chuj, Kayan, Gagou, Urubú, and even Konkani.

I am confident that most readers of this learned journal know in which countries these languages are spoken, but for the uninformed few, the locutions thrive (in the order given above) in: Nigeria, South Africa, Guatemala, Malaysia, the Ivory Coast, Brazil, and India.

(12) A historic new edition, the Revised Standard Version Bible, published in 1973, was the first translation to be approved officially by the authorities of the Roman Catholic, Protestant, and Eastern Orthodox churches. The title page calls the RSV "an Ecumenical Edition."

(13) Protestants and Catholics had long disagreed over what an Ecumenical Bible should contain. Agreement was finally reached in the RSV. Material in the Old Testament, which Protestant theologians once held not authoritative or "canonical" (even though such material is contained in Latin or Greek manuscripts), has now been included; but the books of the Apocrypha are grouped together, and they appear (as in the Hebrew canons) *after* the Old Testament and before the New.

Finally, when the Revised Standard Version appeared, following "a belt of Bibles" in various translations, the London *Economist* dryly remarked: "One should report that Agag, who walks delicately to David in the King James Bible, [but] fat and trembling in the Douay Bible, and with faltering step in the New English Bible, actually walks cheerfully in the Common Bible. Surely that is worth a church controversy or two?" □

*Leo Rosten's most recent book is* A New Guide and Almanac to The Religions of America.

*"What do you mean he got to an analyst just in time? He* is *the analyst."*



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# All the World's a Confessional

by Barbara Mackay

Just a few years ago Americans were telling their dreams, obsessions, and sins only in private—in certain churches or on certain psychotherapeutic couches. Now the very idea of a private confessional seems archaic. Bookstands bulge with confessional potboilers like *The Happy Hooker* and *Fear of Flying;* individuals everywhere gather in groups to chat about and shed personal hang-ups and to raise their communal consciousness; and radio and TV stations are choked with talk shows on which people reveal odd sexual proclivities as readily as others admit to being sun-worshippers or yogurt freaks. The phenomenon has now even invaded New York's stages, which are becoming cluttered with confessional/autobiographical plays.

Self-revelation, of course, is not new in drama. When Oedipus confesses his sins, or when Lady Macbeth mutters guiltily, their confessions relate to both plot and character. But in modern confessional drama, there often are no plots. Confession has come to exist for its own sake.

Nor do these plays bear much relation to traditional autobiographical drama. O'Neill at least bothered to transform the members of his family into viable dramatic characters, but today's playwrights often simply plop remembered parents, siblings, and friends onstage. Instead of writing scripts, they have even been known to transcribe actual dialogue from tape recordings.

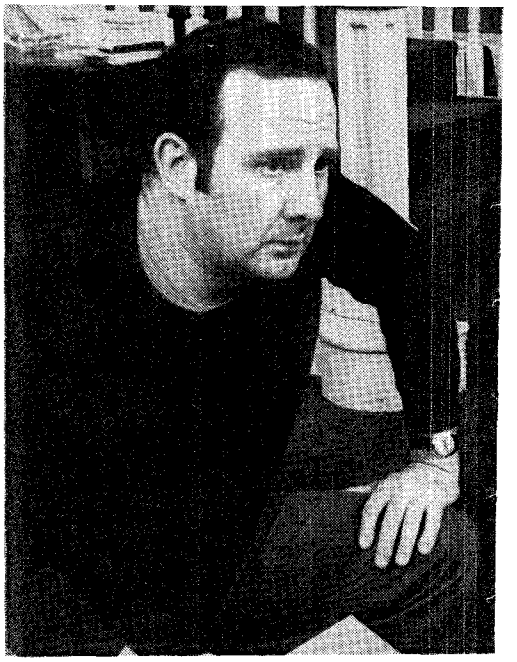
An excellent example of current confessional drama is *A Chorus Line* (*SR*, July 26), a glossy, virtually plotless musical about aspiring dancers. A smash hit when it opened at the New York Shakespeare Festival's Newman Theater last spring—it moved on to Broadway in July—*A Chorus Line* (conceived, directed, and choreographed by Michael Bennett) is set at an audition for a musical. Between dynamic rehearsal numbers, the spotlight singles out one anxious hopeful after another, and each in turn talks about his or her past, present, or dreams of the future.

For the most part, these personal confessions reveal a vast desert of conventional emotions and motivations, as well as a fairly high proportion of male and female homosexuality. One boy took his sister's place at dancing class one day and found his calling; another, sexually abused by men as a child, never got his sex roles straightened out and wound up a miserable "female" dancer in a drag show; one girl's father was a brute, and she found refuge from home in the beautiful ballet; another took up dancing because she couldn't carry a tune.

*A Chorus Line* is a hit primarily because it's fast, polished, and relentlessly entertaining, and also because it sounds the way an audience wants a confessional play to sound—real. Since the cast is made up of bona fide dancers, rather than actors and actresses who pretend to be dancers, there is a ring of authenticity to begin with. One long, exceedingly banal discussion of why dancers dance, and what they do when they can't dance any longer, sounds so realistic, so utterly undramatic, that it almost seems the cast has forgotten its lines and is improvising.

In fact, *A Chorus Line* did begin with just such a dialogue among dancers. After holding a marathon dance-and-discussion session with 24 dancers, Mr. Bennett organized the ideas, added some stories from his own life, and gave the material to James Kirkwood and Nicholas Dante, who created what is supposed to pass for a book. Thus, as on a talk show, most of what sounds so spontaneous is in fact set and rehearsed well ahead of time. But for such a smooth, professional show, it would be impossible to expect anything else. In confessional theater, a real emotional bond between the actor and his or her confession exists only in rare cases.

*Cap-a-Pie* was one such rare show. A production that began, as *A Chorus Line* did, with a taped discussion-improvisation session, *Cap-a-Pie* (Middle French for "from head to foot") was virtually a re-creation of that original session, in which Spanish-speaking actors and actresses reminisced about childhood experiences. But playwright and director Maria Irene Fornes's show, which played last spring in Manhattan's Intar (International Arts Relations, Inc.) Theater, was much simpler and less glossy than *A Chorus Line,* and its confessions remained much closer to their sources.



*Edward Grover (left) and Ken Howar*
*"Emotional and spiritual chaos wit*

Speaking half in English, half in Spanish, the cast (made up of two teachers, a free-lance artist, a social worker, a cab driver, a temporary secretary, and a boy who stated his occupation as "airline") recalled odd, personal moments: a Puerto Rican boy remembered getting up at 5 A.M. to sell bleach water; a girl of Mexican descent re-created her first crush; a young Cuban man told how his family tried to impress the neighbors by buying an antenna for the roof, though they had no television; a Colombian boy talked about his experiences as a Catholic student confessing his homosexuality to a priest.

As an attempt to communicate emotional states, to let individuals express themselves "from head to foot," *Cap-a-Pie* was a success. Since the characters recounted their own memories instead of memorizing parts, they tended to alter the material, to improvise each night and "tell it like it felt" at the moment they were performing. Unlike the actors and actresses in *A Chorus Line, Cap-a-Pie*'s cast didn't have to drum up emotions to fit a fictionalized role. The young Colombian, for instance, was nightly on the



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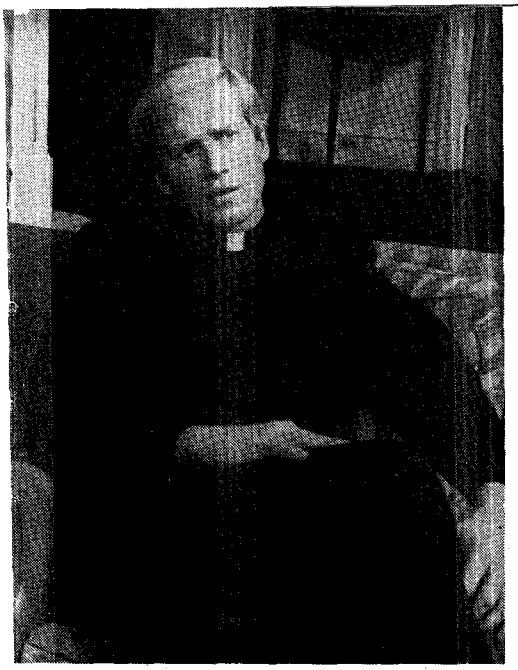

*n a scene from* Little Black Sheep—
*rapid cross-fire of confessions."*

verge of tears when he described Christmas in Colombia and the construction of a village nativity scene.

ALTHOUGH *Cap-a-Pie*'s actors may have been overwhelmed with emotion, as a dramatic event the show was distinctly uninspired. It was more a series of moving, intriguing, unrelated vignettes than a play. In the same way, but on a much larger scale, a feminist disaster called *Parto* tried to string together a batch of mismatched scenes from *The Three Marias: The New Portuguese Letters*, a collection of autobiographical letters written by three Portuguese women, which became a *cause célèbre* in pre-revolution Portugal. One of its authors—Maria Isabel Barreno—helped to write the stage version.

As a chorus of women voice and re-voice their miseries (all caused by men, of course), *Parto* becomes an attack on civilization in general. The distinctions between seventeenth-century Portugal and twentieth-century America blur, and the confused, aimless confessions of desire, fear, rage, and longing build immediately to a high-pitched, monotonous howl, making it difficult to feel sympathy for any of the women. Even poor Mariana Alcoforado, cloistered at an early age, becomes a bore; her naive self-pity and frustration when she can't have the military man she craves are almost indistinguishable from her more mature self-pity after the officer obligingly rapes her.

Fortunately, *Parto* closed before it could be seen by too many people. Given broad enough exposure, such a play could set the feminist movement back several centuries, exposing the mindless atrocities women can commit in the name of art and sisterhood.

OF COURSE there are playwrights more adept than Ms. Barreno and her collaborator, Gilda Grillo, at turning personal history into drama. Yet even the best attempts remain curiously unfocused. Like dreams or hazy recollections, these autobiographical plays seem to blend jumbled ideas and to sprawl from memory to imagined experience. Take Conrad Bromberg's *Dream of a Blacklisted Actor*, which had a brief showcase production last spring. The son of actor J. Edward Bromberg, whose alleged affiliation with the Communist Party got him blacklisted during the McCarthy era, Conrad Bromberg wrote a play true to life only in its structure; the actual details of character and action are imaginary. In *Dream* there is a family like Bromberg's own, but the daughter loses her mind, the son (who can speak honestly only as a ventriloquist, through the mouthpiece of a puppet) runs away from home, and the wife finally leaves her husband. In reality, Bromberg didn't have a puppet, his sister didn't go mad, and his family didn't break up until after his father died. Still, the play probably wouldn't have existed if Bromberg hadn't had the childhood experiences he did.

The most curious thing about this autobiographical play is that its main character (the actor) is less interesting than his son, whose fear and admiration of his father make him verbally schizoid. The serious things he says are always filtered through the mouth of his doll. There is an intensity about that character—perhaps because it is Bromberg's unresolved representation of himself—that should have been explored. Instead, Bromberg chose to tell the story from the father's point of view and never really examined the relationship between the son and his successful father who becomes a failure, a relationship that obviously intrigued him. It's one production that might have been better off if the author had really told his own story, relying more on autobiography and less on artifice.

Like Bromberg, another young playwright, Tony Scully, attempts to deal with his own past in *Little Black Sheep*, which played at Lincoln Center's Vivian Beaumont Theater last May. The play takes place in the Jesuit residence in New Haven, Conn., where Mr. Scully, a former Jesuit, lived for three years. The characters are mainly quirky Catholics: a young sceptic, an aging alcoholic priest, a confused young father who appears dressed in outrageous drag at the end of the second act, a repressed nun who appears naked from the waist up at the end of the first act, and a handsome, golf-playing Wasp who looks more like a playboy than a priest.

Mr. Scully obviously wanted to create a sense of large-scale emotional and spiritual chaos by keeping up a rapid cross-fire of confessions. Oddly enough, though, these confessions are not of sins, but of hang-ups. The characters in *Little Black Sheep*, convinced of the rightness of their personal stands on everything from God to sex, are all miserable and in general are more interested in reviewing their own problems than in helping, or even listening to, one another. All they can do is confess their cardinal unhappiness, from which even the Pope couldn't absolve them.

Though Mr. Scully's play is an interesting attempt to deal with the problem of being a religious person in an increasingly irreligious society, and though his play is an extremely, almost painfully, honest autobiographical study, which doesn't depend on sympathetic characters or on palatable, pre-packaged confessions, *à la Chorus Line, Little Black Sheep* points up two major limitations of most confessional drama: after everyone's story is told, there's simply nothing else to say; and unless the play builds substantial relationships among its characters, its confessions will become empty, ultimately meaningless exercises in self-examination.

Perhaps confessional drama is a reaction to the lies of Watergate. Perhaps it's the legacy of the older, George Washington/cherry tree tradition, or of the self-critical tradition of Henry Adams. Or perhaps it's simply a logical, personalized extension of the nostalgia craze. Anyone's history, no matter how tedious, is now fair game. But whatever the roots of confessional drama may be, its effect is unfortunately one of alienation. The past is evoked and the present outlined—sometimes charmingly, sometimes sadly or with humor—but the experience remains a bit fragmented and remote, as if one were sifting through a pile of some stranger's disorganized photographs. I confess I can think of several hundred more exciting ways to spend an evening. □



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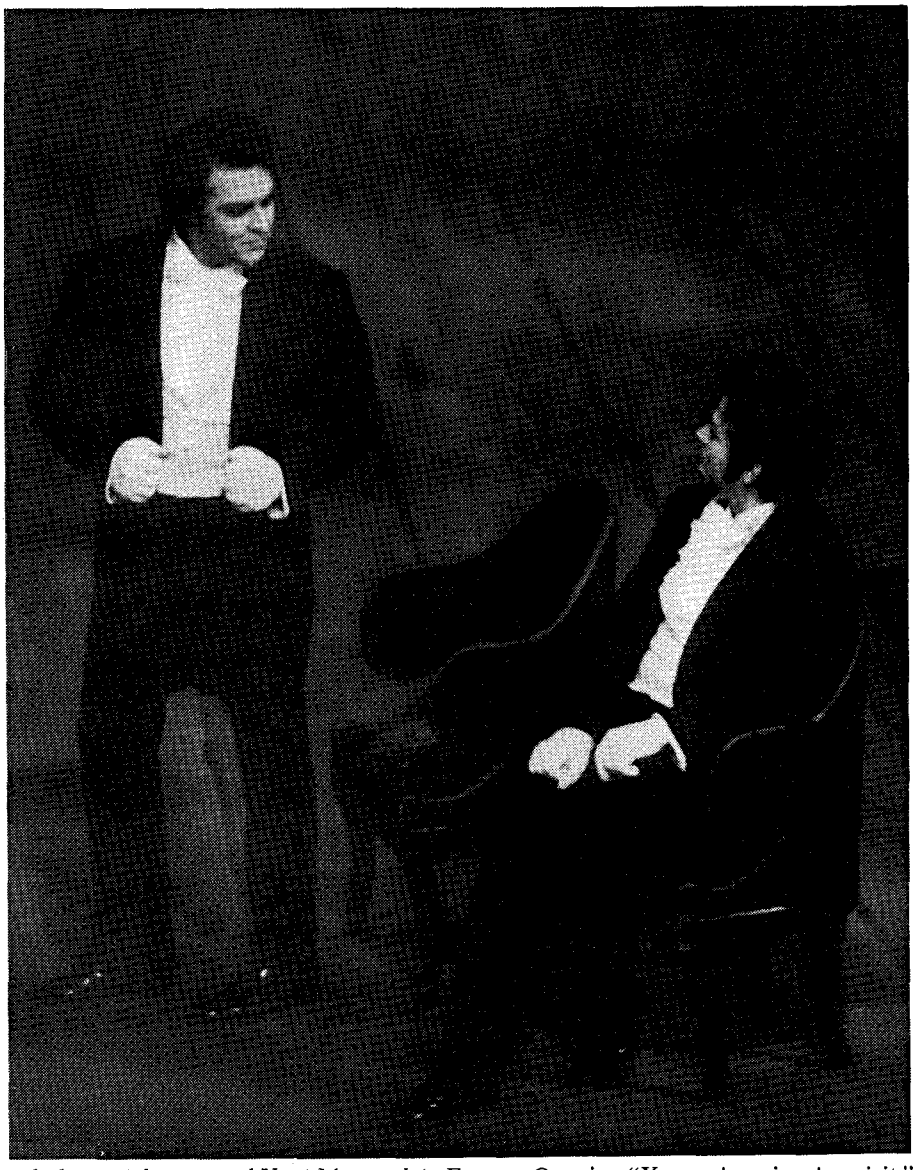
# Music to My Ears

by Irving Kolodin

## The Young Old Bolshoi Opera



*Vladimir Atlantov and Yuri Mazurok in* Eugene Onegin—*"Young in voice, in spirit."*

Call it company manners, call it pride in professionalism, the Bolshoi Opera provided audiences in New York and now in Washington with a kind of experience they couldn't otherwise have this side of Moscow. During its first two weeks at the Metropolitan Opera House, in a range of works from Moussorgsky's *Boris Godunov* and Prokofiev's *The Gambler* to Tchaikovsky's *Eugene Onegin* and *Pique Dame*, the company soon took on the likeness of old friends. Or, perhaps, they should better be described as young old friends. It is a particular distinction of this extraordinary assemblage of people that, however old they may be in tradition, they are distinctly young in voice, in spirit, in commitment to their profession.

Of course, what they have to offer is different from what we are accustomed to hearing in U.S. opera theaters and in most European ones. There would be little point in bringing them all this way for performances in two American cities were it otherwise. Most of the ways in which they are different are not merely to their credit but also stimulating: their concept of ensemble and of playing together as colleagues rather than as stars and supernumeraries, their uniformity of approach to a repertory distinctively their own.

Some of the other ways in which they are different are less creditable: in their attachment to outmoded scenic concepts, in their affection for patterns of direction that have had their time and should be replaced, in a quaint devotion to groupings and tableaux that were gone not merely with the talkies but with silent films. More penalizing than anything else is the habit of invoking "tradition" when they are challenged to defend some provincialisms that are, otherwise, difficult to justify.

Somewhat like the seven pillars that distinguish the façade of its home in Moscow from any other opera house in the world, the Bolshoi performances are supported—regardless of repertory or cast—by equally firm sources of strength. They are the magnificent chorus, the equally superb orchestra, and a quartet of conductors, headed by Yuri Simonov, who could interchange assignments with no loss of effectiveness or order.

The one work new to the United States in this first fortnight was Prokofiev's *The Gambler*, which could be described as an involved, vocalized form of Russian roulette. Derived from a novel by Dostoevski, the opera involves a metaphorical pistol in the hand of a compulsive gambler (Alexei). The action takes place in an imaginary Roulettenburg, on a revolving set that in itself might be construed as a huge roulette wheel. As the story unfolds, the table revolves to show a new locale in the casino. Best of all is the final, all-encompassing vista of the gambling hell (or heaven, according to the results).

Much of the early action is devoted to vignettes of gambling characters having only a little to do with the outcome. In the end, having escaped all prior dilemmas, including the numbing effect of losing an inheritance that would enable him to marry Pauline, Alexei finally has a run of luck in which he breaks one bank after another. But when the deliriously happy Alexei presents his winnings to Pauline, the live bullet is discharged: she throws the money in his face and dashes off.

The second half of the second act (a combination of episodes originally specified as separate "acts") is much the best



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part of the score, which was written in 1915 and extensively revised a dozen years later. By then Prokofiev was quite a different composer, capable of constructing a second act with pace and a powerful (ostinato) climax. But the first act is monumentally talky, especially for a non-Russian. The work was remarkably well performed in its leading roles by Alexei Maslennikov (Alexei), the beautiful Makvala Kasrashvili (Pauline), and Larisa Adeyeva, as the rich old Grandmother who comes to Roulettenburg with a bundle and loses it, to the distress of those who are depending upon her for an inheritance. The production scheme, derived from a kind of German Expressionism into which Emil Jannings would have fitted very comfortably, was no more alive than much of Prokofiev's score, but it supported a series of character vignettes painstakingly, vividly acted.

AT THE OTHER EXTREME of familiarity was Moussorgsky's *Boris*, which has had hundreds of performances in America since it was introduced in 1913. The Bolshoi production is *sui generis* in the splendor of its outdoor scenery (for the Coronation and the St. Basil scene in particular) and in the rousing resonance of its choral singing and the impassioned playing of the orchestra under Simonov.

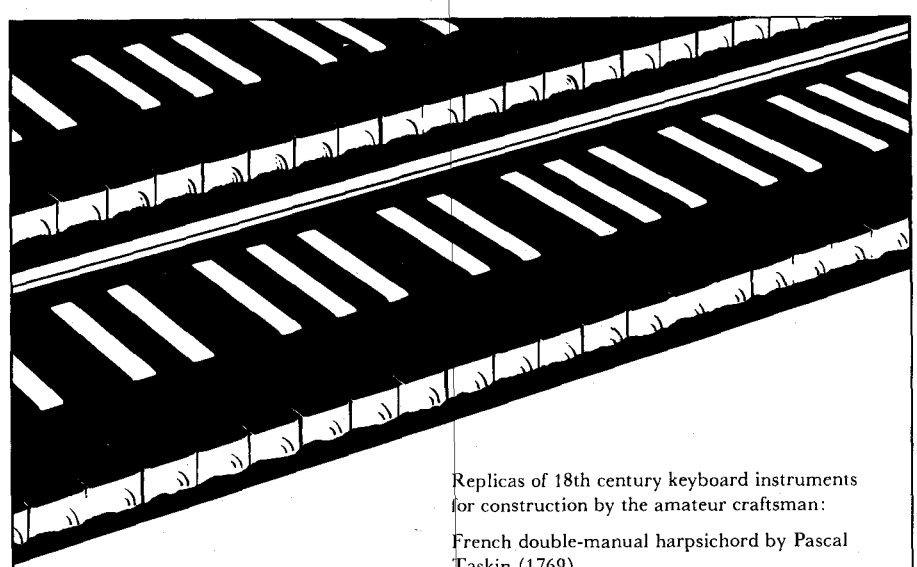
Some people who think there is only one way to use a voice suggested that the Russian way is wrong, even though the Russians use it primarily to express the *language* in which they perform, which happens, of course, to be their own. I would not say that Yevgeni Nesterenko, the Boris of the opening performance, does not know "how" to use his voice—the Boris was somewhat choked, without the kind of resonance associated with a Siepi or Talvella. When he played an important role in *Eugene Onegin* a few days later, he sang—yes, *sang*—a version of Prince Gremin's air that could hardly be surpassed for flowing legato or pliability. So the question is not voice or method so much as *usage* to a specific objective.

The strengths of the *Boris* also included such splendid specialists as Vladimir Atlantov as Dmitri, Yuri Mazurok as Shchelkalov, Mark Reshetin as a marvelous Pimen, Elena Obraztsova as Marina, and Artur Eizen as a drunken Varlaam one could almost smell. But it is sadly let down by its fidelity to the Rimski-Korsakov instrumentation, the absurdly truncated version of the Polish scene (what price "authenticity" in a cut *Boris* from Moscow?), the ending with the death of Boris rather than with the Simpleton lamenting the future of Mother Russia, and a female singer for Feodor, instead of the preferable boy soprano. In a press interview, Kiril Molchanov, the company's director general, suggested that last winter's Met production—which did most of these things *right*—had been "pushed in" to anticipate the Bolshoi visit. Come on now, comrade: a new *Boris* would have been given five years ago had there not been a labor dispute in 1969–70.

Though the Bolshoi contends it has no stars, the names of Atlantov, Mazurok, Nesterenko, and one or another of the ladies heard in the early performances of *Boris* continued to turn up in the first performances of *Onegin* and *Pique Dame*. This was a mere matter of prudence, for Atlantov in particular is a performer any company in the world would welcome; he is youthful and good-looking, and combines power with finesse in a span of Dmitri, Lensky, and Hermann that qualifies him to write, large and firm, the words "I am a tenor" beside his name.

Whether these or others were in the cast, the performances of *Onegin* and *Pique Dame* derive from so basic a part of the Bolshoi conditioning, so singular a mingling of vocal and instrumental sound, that they fulfilled totally the expectation of deep, abiding pleasure. Whether in the second-act waltz or the third-act Polonaise (a ballroom scene that stretched back to the deepest point of the Met stage) of *Onegin*, the spacious interior of the Countess's bedroom or the atmospheric gas-lit scene along the canal in *Pique Dame*, these were evocations of time and place difficult to duplicate and impossible to resist. Similarly impossible to duplicate but altogether easy to resist was the feebly routined chorus action at the beginning of the last scene in *Pique Dame*. Better Western confusion than such routine.

By and large, the Bolshoi Opera (even at very high prices) was a very good buy and a very large experience. Come again, Bolshoi Opera—soon. □

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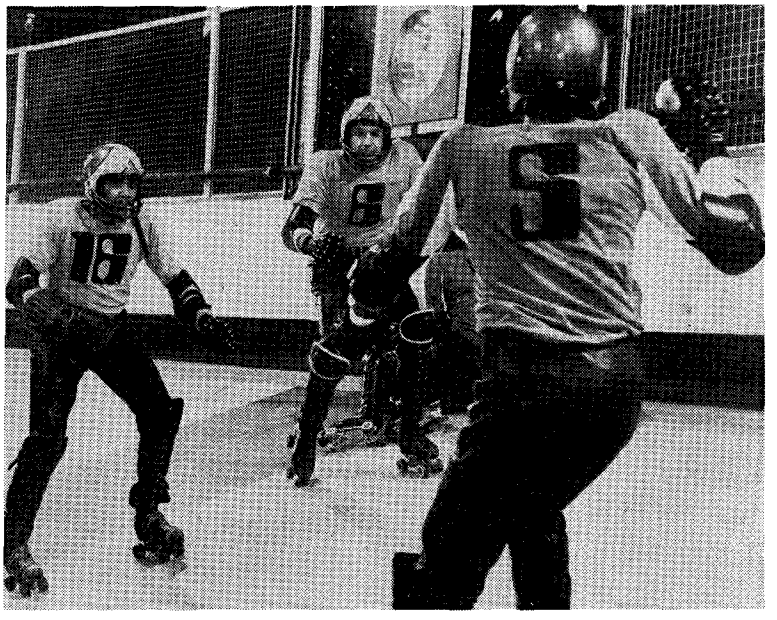
# Seeing Things

by Hollis Alpert



*James Caan (center) playing Rollerball—*
*"Hostile impulses are channeled into the game."*

## Future Jock

Curiously, *Rollerball*, a film directed by Norman Jewison from a short story and script by William Harrison, has more to do with today than the future that it purports to present. It extends the violence inherent in such sports spectacles as pro football, ice hockey, motorbiking, and the roller derby into literal bloodbaths. And, while the film posits a society in which hostile impulses are channeled into vicarious participation in the game of Rollerball, which deals injury and death to those who play it, the game itself is a good deal more interesting (to the movie-viewer) than the all-too-simplistic view of the future. Therein lies the flaw both in the film and in what we can assume to be the purpose behind it.

Instead of sitting in the usual screening-room atmosphere, with the critical fraternity impassively watching whatever horrendous things happen on the screen, I saw the film with a paying audience of about 1,000. And when James Caan, as leader of the Houston Rollerballers, strews his opponents about the arena on his way to scoring winning goals, a good many in the audience appeared to forget that their minds were supposed to be involved, and cheered as though they were watching the Philadelphia Flyers in action. This might be taken, of course, as a reflection more on movie audiences than on the director. Yet it's hardly a dirty little secret that violence—whether on a home screen, in a movie house, or on the playing fields—pays very well. Movie-company executives know this, and, in the case of United Artists, it is unlikely that $4 or $5 million would have been invested in a film about the future world that showed nothing but the problems of the seven ruling multinational corporations. Sex on the screen has pretty much run its course; there's absolutely nothing left to shock us. But violence still has its intriguing possibilities, and the originality in *Rollerball* lies in the way the violence is decked out.

A few years ago Stanley Kubrick's version of *A Clockwork Orange* came along and caused something of a furor because of its heavily stylized and ironic violence. Some attacked a film of acknowledged brilliance for its seeming to make its mayhem, rape, and murder virtually pleasurable. The director's own detachment from the cruel implications of the story didn't help matters; it was hard to know which side he was on—society's, or the individual's freedom to express himself (!) in his own wanton way. Norman Jewison is less detached, but his feelings are plainly mixed. On the one hand, he wants to show us how the million eyes of television (make that 2 billion in his corporate world of the future) breed a fascination with violence—that the tendency is for more, not less. On the other, he and Harrison have invented a game, and he wants to show that game as vividly as possible. Unfortunately, most of the satisfactions the audience gets come from close-ups of players meeting serious injury through blows delivered with studded gloves and armored knees and elbows.

After something known as "the corporate wars," the world, now a nation-state, is being run by seven global corporations, each dealing with a particular field: energy, food, housing, luxury, transportation, and so on. Houston is the energy headquarters; Chicago runs food. "Whatever happened to Indianapolis?" someone asks with a yawn. An executive team does the managing, with John Houseman, of Houston, in overall charge—chairman of the board, so to speak. The world's inhabitants have traded their freedom and independence for comfort, pleasure, and omnipresent video. Women are invariably willing, and boredom can be overcome with pills that provide a pleasant, dreamy state. The game, Rollerball, has been invented to provide an outlet for antisocial feelings and also to show the futility of individual preeminence, for no player manages to survive it for more than two years. An exception: James Caan does and accordingly becomes a worldwide, or "multivision," hero. The corporate state can't abide this circumstance and so changes the rules of the game. No holds barred, no penalties, no substitutions, no time limit. The ultimate game.

All very neat, but quite unreal. The film basically doesn't work because the empty fantasy of the future is blended with the all-too-real clobbering that goes on in the arena. And it's the game that's going to sell the movie. It's played on roller skates, except for three men on each team who ride motorbikes, onto which the skaters can hang for greater speed. A steel ball is shot out of a cannon into a gutter that runs around the circular arena. Whoever dares to pick up the hurtling ball has the chance to plunge it into a magnetic "goal." Team members use every conceivable method to keep this from happening. Technically speaking, Jewison's photography is superb. The design of the arena is both fanciful and baleful. James Caan is convincing as the ultimate jock, and John Houseman is sleekly ominous as the ultimate executive. The trouble is, the game gets the better of everyone concerned. □

Answer to *Wit Twister* (see page 39): cruet, eruct, truce, curet, cuter.

Answer to *Literary Crypt No. 39* (see page 37): there are people who so arrange their lives that they feed themselves only on side dishes.

Ortega y Gasset



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# Dance

by Walter Terry

## Capsule Comments

"Hommage à Ravel," a festival of 16 new ballets set to music of Maurice Ravel (born 100 years ago), was far from festive; it succeeded instead in depressing the dance scene to a remarkable degree. The **New York City Ballet** interrupted its May-June repertory season at the New York State Theater with three different Ravel-rooted programs (each given four times, plus a gala benefit preview) ranging from the deadly to the dreary. The values of this affair would appear to be limited to a sizable sum of money resulting from the gala, the conferring of the Légion d'honneur upon the company's artistic director and principal choreographer, George Balanchine, and opportunities for front-page, society-page, and arts-page publicity on an imposing scale. But the truth of the matter is that the whole "Hommage" deserved a *légion d'ennui* citation for being a very feeble, very transparent gimmick.

"The Stravinsky Festival" of 1972 by the New York City Ballet had been a success. Not every ballet was a smash, but out of 31 ballets involving Stravinsky, several were longtime repertory masterworks, and a few of the new pieces (21 premieres) proved eligible for permanency in the troupe's repertory. Igor Stravinsky and Balanchine had been historic, monumental collaborators since 1925. Certainly a posthumous celebration of the composer's ninetieth birthday was in order. But Ravel?

Ravel did compose ballets, and even his non-ballet music has ingredients that may suggest choreographic recipes. But an entire festival of Ravel? Before it started, Balanchine asked, "Why not?" Now that it's over, we can moan, "Why?" For it is unlikely that anything lasting came out of it. It was, as I say, a gimmick. If Stravinsky worked, why not Ravel? Besides, something gala had to be dreamed up in order to raise funds necessary to match a needed Ford Foundation grant. Ravel had a convenient birthdate, French connections could be exploited, musically it would be of some interest to the music-minded if not the dance follower. But why not commemorate the one hundred fifth anniversary of the death of Cesare Pugni? After all, he composed 320 ballets and deserves note for stick-to-itiveness, if not always for quality.

The **Stuttgart Ballet,** visiting America for the first time since the untimely death of its director-choreographer genius, John Cranko, began its New York season with such Cranko masterpieces as the evening-long *Eugene Onegin, Romeo and Juliet,* and his staging (retaining parts of Petipa and Ivanov) of *Swan Lake*, all with glorious designs by Jürgen Rose and all danced superbly by the Stuttgart stars, soloists, and corps. Marcia Haydée and Richard Cragun returned in absolutely peak form singly and as a stellar team; Egon Madsen danced (and acted) one of the greatest Siegfrieds in *Swan Lake* I have ever seen and also gave us his frisky, debonair, tragic Mercutio; Birgit Keil emerged as the great German ballerina of the day and, very probably, of this century; and little Joyce Cuoco, with her phenomenal technique, leaped forward in matters of artistry.

But the Stuttgart, with illustrious ballet antecedents going back more than two centuries, is facing a new frontier. With Cranko gone, the new director is the American choreographer Glen Tetley, whose works (chiefly in modern-dance styles) are much more popular in Europe than they are here. No one can follow Cranko in creating those full-length dramatic-romantic ballets that are the Stuttgart's trademark, but Tetley seems to work at the point farthest from this style. His dances are exercises in difficult steps, and for me they seem to have no sequence, no cumulative pattern, as if he had contrived difficult or even brilliant movements in isolation, with few if any emotional or human nuances, movements that would work, or not work, in any order. New Yorkers and audiences in Washington, D.C. (the only two cities on the Stuttgart visit), saw Tetley's new *Daphnis and Chloë,* not as disastrous as Taras's but a huge aimless bore in which the plot was thoroughly stifled; *Arena,* a modern-dance work focused on unrelieved bodily violences, sadistic and gory. *Voluntaries,* Tetley's first work for the company, has proved popular with European audiences and was successful here, but once again I found it not so much a ballet as a series of challenging steps that Haydée, Cragun, and the rest illumined with their artistry, just as an audience once wept with wonder when the great Polish actress Helen Modjeska forgot her lines in English and, with passionate inflection, delivered the alphabet in Polish. Whether Tetley can only deliver to the great Stuttgart Ballet an alien alphabet, or whether he can eventually give them those danced dialogues, soliloquies, and choruses of drama at which they excel, remains to be seen.

In spite of the glittering jewels and platinum and gold on stage and in the audience, the most resplendent moment at the fiftieth-anniversary celebration of the **Martha Graham Company** at a gala June 19 at New York's Uris Theater was when the First Lady of the Land, Betty Ford, curtseyed (on stage) to 81-year-old Martha Graham. The program, with seats selling for as much as $10,000, was arranged to pay off Graham company debts and to assure the continuation of the troupe. More than $200,000, including the jewels on the donated costumes, was realized, thus paying all bills and supplying some money (more will be needed) for a winter Broadway season for the Graham dancers. The special money-magnet for the gala was a new ballet, *Lucifer,* choreographed by Miss Graham especially for the ballet world's most celebrated stars, Rudolf Nureyev and Dame Margot Fonteyn. The artistic merit of the new piece, in which Nureyev was minimally clad and Dame Margot was essaying modern dance for the first time, was debatable, but that it was superbly successful as a *pièce d'occasion* was indisputable. □

Martha Swope

*Rudolf Nureyev as Lucifer, Dame Margot Fonteyn as Night, Betty Ford (one-time Graham student), Martha Graham.*



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National Park Service

*Park ranger and tourist at Yosemite in the 1920s—"Pandering to the Sybarites?"*

# Out on a Limb

by Horace Sutton

In an article on Colorado ("In a Colorado Corner," *SR*, May 17), I wrote that Tamarron, a $20 million resort near Durango, was about to open for its premiere summer season. It had been built, I said, "with great style and low profile, among the pines of the San Juan National Forest." Deep in the piece I stated that the resort was using "about 600 acres of the San Juan National Forest for its buildings and its athletic fields."

Those statements in the piece set off a flurry of indignation in various parts of the Republic. Mary Eldredge of Vacaville, Calif., wrote that she was shocked that Tamarron has used 600 acres for its facilities. "What I want to know is how this happened! How did they acquire part of a national forest? Who are the people who own it and financed it?"

In New Canaan, Conn., Elsbeth Liebowitz found it all "an outrage." She asked, "Are national forests supported by public moneys and presumably left either in a wild state or used for the benefit of the general public, to be taken over and exploited by commercial enterprises that cater to the wealthy few? Doesn't this go counter to the purpose of setting aside public lands? Pandering to the Sybarites?"

John S. Holden of Carbondale, Colo., who described himself as a "hardened old prospector of the Colorado National Forest," said the sentence in which I referred to the 600 acres sent shivers up his spine. "This forest that is already violated by too many crass business interests is now being lured into a silk-sheeted bed by environmentally minded developers who keep a low profile." He suggested that we "ask the management of Tamarron what they are going to do to keep the deer and elk off the greens and fairways every spring, and ask them how many ranchers sold their water rights so that they could have an 18-hole golf course."

Particularly distressing, Mr. Holden thought, was the fact that this developer had been given "thousands of dollars worth of advertising at the same time that [*SR*] was revealing an incredible land grab right out of Uncle Sam's pocket." And he had thought all along, he said, that "*SR* really stood for the best thinking there was on environmental and conservation matters." Meanwhile, Mrs. Liebowitz was asking, "Isn't this something that *Saturday Review* ought to look into?"

Well, we have. Tamarron in its literature makes the flat statement that it is a "new resort in the 2,000,000-acre splendor of the San Juan National Forest." And indeed, before one gets to the entrance of Tamarron there are government signs indicating that one is entering the San Juan National Forest. However, the 600 acres that the resort itself occupies is actually a finger of privately owned land which extends into the national forest. The only literal *transgression* of public lands, if that is the proper word, is the buried water line which feeds Tamarron and for which the government issued a special permit.

The day I flew out of Durango—bound, as it happened, for Albuquerque—my seatmate turned out to be an inspector for the U.S. Forest Service, and we entered into a long discussion about the use of federal forestlands for recreational purposes. While I was well aware that national parks worked with private entrepreneurs in operating lodges, buses, and other recreational facilities—sometimes, as we have written on these pages, to an extreme—I was unsure about Forest Service policy. My seatmate assured me there was considerable recreational usage of the national forests, too, as I was to find out when I pressed the matter further in Washington.

THE U.S. FOREST SERVICE, which is a division of the Department of Agriculture, maintains a special section that deals with recreational management. The Forest Service issues special-use permits for long periods of time to private entrepreneurs for the purpose of providing public recreation. The basic terminology, thus stated, is theirs. It provides the opportunity for private capital to underwrite the costs of these recreational facilities. It is only through the private sector, it says, that recre-



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ational facilities can be built, and since it recognizes the need for private enterprise to make a profit it must accept the practice of charging fees to those who would enjoy the private life on public lands.

As early as 1914, private recreational homes were allowed to be built on public forestlands. Such arrangements, though not kept secret, were not publicly announced. With the recognition of the need for stricter environmental control, permits issued by the U.S. Forest Service have been put through a land use–planning process. When a proposal for the private development of public forestland is submitted to the U.S. Forest Service, an environmental-impact statement is issued and publicly aired. The procedure, as Washington says, "is very open." The public has 60 days in which to criticize or object to the proposal. When that period has expired, a decision is made by the Forest Service. The public then has the right to appeal the decision, but it is the government that delivers the ultimate ruling.

Although no new homesites on government forestlands are even considered, thousands of permits for private use of public lands are issued. They include the right to install power lines, water pipes (such as the one at Tamarron), reservoirs, and a variety of recreational facilities, among them ski areas including lifts, resorts, and climbing huts.

Some of the nation's best-known and most popular recreational centers occupy lands that fall within the federal borders of the U.S. Forest Service. Diamond Lake Resort, on the slopes of the Cascade Mountains, in Oregon, has a marina, restaurant facilities, and 400 beds on Forest Service land. Similarly, so does the well-known, government-owned rustic lodge at Mount Hood, in Washington. Crystal Mountain Ski Area, in Oregon, which includes two hotels and privately owned condominiums (open to the public for rental), is also within the perimeters of Forest Service land. So is the Saguaro Marina, in the Coronado National Forest in Arizona, and, on the opposite side of the country, the Appalachia Mountain Club, at Pinkham Notch, in New Hampshire's White Mountain National Forest.

AT PURGATORY, a few miles away from Tamarron, the ski lifts and the slopes occupy federal forestland, but the base facilities, condominiums included, are on private land. The same situation prevails at Vail, the famed resort in Colorado favored for winter vacations by President Ford. In his letter to *SR*, John Holden, the self-described "hardened old prospector," states, "It was bad enough when Vail Associates and Snowmass [at Aspen] got ahold of some private land at the foot of the beautiful Colorado mountains and then persuaded the Forest Service to let them build ski lifts and trails. . . . The real assets that the promoters of these ski areas are cashing in on are the climate and the slopes of those mountains."

It certainly can be successfully argued that the issuance of ski facilities on mountains within the limits of the U.S. Forest Service may well attract a rash of commercial enterprises to adjacent privately owned lands that might otherwise have remained in some sort of bucolic form—farm or ranchlands, for instance. There is no doubt that commercial enterprises, particularly recreationally oriented enterprises, change the land use. The Forest Service is eager to indicate that approximately 8 percent of all the land area of the U.S. is national forest, much of it wilderness area.

The broad umbrella of "conservation" can cover many meanings. In its purest form, pristine areas, wild animals within them included, are protected in perpetuity, unviolated by man's transgressions. But that is conservation without appreciation, and there are those who cast reasonable doubt on that concept. Secondly, there is conservation *with* appreciation, which was the basic idea of the national parks, first established when President Grant signed legislation, in 1872, creating Yellowstone National Park, the first in a string that now numbers more than 30.

But, as has been said, there exists a curious anomaly, for while the national parks are created in the public interest, and it is the tourists themselves who create a public interest in the maintenance of wildlife preservation, the animals, if they are to exist in a native state, should not be bothered by public attention. A prime example of the violation of this basic code is the bears that line the roads in Yellowstone, stopping traffic so often during the summer months that the tie-ups are called, by the rangers themselves, bear jams.

Providing public roads, parking lots, hotels, and campsites within protected national lands has also induced excesses, notably dance halls, rubber rafting down streams, even such unnatural spectaculars as the fire fall, since discontinued, which called for dumping a large bonfire over a cliffside within Yosemite National Park, all for the public delectation.

While an effort has been made to ensure a broad spread of prices for lodgings within national parks, all too often the rates rise into the stratosphere. Or the range leaps abruptly from low-cost camping to high-cost hotel-resort com-

**Booking a Tour With the Bard—No. 1**

*These jottings, all from the pen of William Shakespeare, have been plucked from his works by the celebrated Shakespearean actor Arnold Moss. If you are unable to place the travel phrase in the proper play, turn to page 59 for the answers.*

(1) Be merry, here's the map!
(2) Confirm her flight.
(3) Call it a travel that thou takest for pleasure.
(4) The undiscover'd country.
(5) Go travel for a while.
(6) In the morning early will we both fly.
(7) As I travell'd hither through the land, I find the people strangely fantasied.
(8) Is this a holiday?
(9) I have a journey, sir, shortly to go.
(10) Let's to the seaside, ho!

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# Saturday Review's

# Twenty-first Annual Travel Photo Contest

## Honoring the American Bicentennial

### Contest Rules

1. *The Bicentennial Travel Photography Contest is for amateur photographers only.* Professional photographers (individuals who earn income from taking or selling photographs) are not eligible; nor are employees of SATURDAY REVIEW or their families and relatives.
2. Contest entries must have been taken *on a trip made this year* and in a locale within the 50 states or in any commonwealth, possession, or trust territory of the U.S.
3. Black-and-white prints, color transparencies, and color prints are acceptable; prizes will be awarded in two categories: black-and-white and color.
4. Each entrant is limited to two entries in each category, i.e., two black-and-white prints and two color prints or two color transparencies or one color transparency and one color print.
5. Black-and-white Category:
   (a) Prints must be *unmounted* glossies no larger than 11"x14".
   (b) On the back of the print must appear: entrant's name and address; make of camera and film used; date and place entry was taken.
   (c) Developing and printing may be by the entrant or by a commercial photofinisher. No artwork or retouching of print or negative is permitted.
   (d) No black-and-white entries will be returned.
6. Color Category:
   (a) Color transparencies must be *originals* and in cardboard slide-mounts. Duplicates and glass mounts are not acceptable.
   (b) Color prints must be *unmounted* and no larger than 11"x14".
   (c) On the back of each print and on the mount of each transparency must appear the same data specified above for black-and-white entries.
   (d) Color prints will not be returned. Transparencies will be returned only if accompanied by a self-addressed, stamped envelope and protective cardboard.
7. Entries will be judged on photographic quality, originality of subject treatment, and the sense of place (locale, local color, etc.) they convey. The judges will be a panel of *SR* editors, and their decision will be final.
8. Winners will not be notified before December 1, but a list of winners will appear in the January issue of 1976.
9. *SR* will not be responsible for condition of entries upon receipt or upon return. The sender assumes all risks.
10. *SR* will not enter into correspondence with entrants about their entries; no letters accompanying entries will be acknowledged.
11. Before receiving a prize, the entrant is obliged to sign a statement that the entry is the work of an amateur photographer; that the entry, or any closely similar picture of the subject, has not been and will not be entered in any photography contest other than the *SR* Bicentennial Travel Photography Contest, and has not been and will not be offered for publication in any manner prior to January 3, 1976. *SR retains first publication rights to prize-winning photographs* as well as those that receive honorable mention. *SR* reserves the right to use such photographs for promotional purposes (including exhibition in a traveling show during the Bicentennial Year).
    Original black-and-white and color negatives (as well as model releases) for prize-winning entries must be made available upon request.
12. Awards for winning photographs which are travel prizes (see page 1 of this issue for list of prizes) are neither transferable nor convertible to cash.

Entries must be postmarked no later than September 22, 1975. Mail entries to: Saturday Review Travel Photo Contest, 488 Madison Ave., New York, N.Y. 10022

plexes, along the lines that the developer would himself like to occupy. As one avowed conservationist, who is also a resort developer, once told me, the leaders of the nation have a need, too, to work off the ardors of their labors and responsibilities. That is undoubtedly true, but captains of industry also have access to country clubs and similar watering holes not always available to blue-collar (and many white-collar) laborers. The very remoteness of national preserves often denies, by their geographical location, their use and enjoyment by those with limited incomes.

Much has been made of exploitation of national parks, notably the game reserves, in East Africa. It is true that in some game parks in Kenya, especially at Amboseli, a ring of tourist vehicles often surrounds a pride of lions (*SR*, March 8). Tsavo National Park is so vast that the scattered lodges and tourist vehicles don't obtrude upon the game. The environmental outrages are committed by poachers seeking skins, heads, and especially ivory tusks. But there are some conservationists who protest the wholesale trampling of forests by the elephants themselves and call for "cropping the herds," a polite euphemism for shooting animals when their number exceeds the limit that the land can sustain.

The establishment of national preserves has become a worldwide conservation effort. Tiger, leopard, bear, and barking deer inhabit Hazaribagh National Park in India, established in 1954. Indonesia, under the Dutch, set aside a preserve in south Sumatra, which remains the protected home of gibbons, tapir, elephants, and the Sumatran rhinoceros.

Establishing preserves in which rare animals can survive in wild and native habitat is of inestimable value to scientists, to those who have the opportunity to view them for pleasure and wonder, and for what is collectively called "posterity." Man must walk a narrow ledge between his need to cleanse himself of the pressures of a high-speed and exacting life on one hand and the basic necessity of preserving a corner of his land in a relatively pristine state. Maintaining a balance is the problem, and it is the overbalance that excites sensitivities of partisans of all camps. What can be argued, successfully perhaps, is the basic tenet that conservation or preservation without the opportunity for public appreciation offers limited rewards to mankind. □



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# Curmudgeon-at-Large

by Cleveland Amory

The other day we sat on a plane with a horseplayer. Not an average horseplayer, mind you, but a confirmed one. One who imbibes *The Racing Form* as if it were mother's milk. And, of course, he studies breeding. Not just the sire of the horse but also the dam. You know, by Malaprop out of Damsel in Distress—that sort of thing. And then the grandsire and the granddam. He knows, for example, whether a horse has "good breeding" or "great breeding" or even the sad "no breeding." "Breeding," he told us, "is *everything*. But remember! When you breed to a horse like Secretariat, it's not the first get you want, it's the *second*. It's the second get that's important."

We got to wondering why, if breeding is so important for race horses, well, why confine it to them? At least we ought to consider it for other athletes—we mean the two-legged ones. After all, we bet on them, too. Take this on-again, off-again romance of Chris Evert and Jimmy Connors. Stop it. It's time they got down to business and thought about the really important thing—America's 1994 Davis Cup team.

But don't knock Jimmy and Chris—they are actually pioneers. Baseball and football are way behind. It's time they shaped up. Why should baseball teams, for example, have farm teams? That's nonsense—what they really need is stud farms. You let a Nolan Ryan or a Tom Seaver go out and choose his own wife, for heaven's sake, and where does it get you? I'll tell you where it gets you—damn few second-generation ball players even on the second get. Or take football. You want a 300-pound tackle who can run the mile in nine seconds, right? Right. Well, women are coming on like crazy in sports. Take one of those women track stars. Then you get your gorilla . . . What are we saying? But there's an idea there, too. We just don't think we will go into it.

Of course, this thing is bigger than sports. Take your boss. Why let him marry just anybody and have a no-good, second-generation nothing for a son who will let the business go to pot? Women's lib has pioneered a whole new crop of lady executives. Choose one! With first-class ability. Get her together with your boss. And again, get the second get.

Finally, what on earth are we doing in the most important office of all? We're just letting our Presidents come along at random. It's got to stop. Plan 20 years ahead. First, you find an old Boston Adams (they're still around) and a young Roosevelt girl. It doesn't matter—either Oyster Bay or Hyde Park. Just get them together.

DÉJÀ VU DEPT.—as found by Irving Bernstein of Surfside, Fla., in the *Miami Herald*:

Air Force bomber crews have been ordered to begin training for fighting a limited, unclear war. . . .

We say, let's make the next war *perfectly* clear.

BUREAUCRATIC SHUFFLE—as sent on by Mrs. B. A. Bowditch of Weston, Mass., who received it from the Office of the Assistant Secretary of Defense:

Dear Mrs. Bowditch:

This is in response to your request concerning aerial photography of Baffin Island, Canada.

Any photography of a foreign area which may be available from the resources of the Department of Defense has been obtained by agreement with the nation concerned. The address you should contact for authorization is:

Embassy of Haiti
4400 17th Street, N.W.
Washington, D.C.

Maybe they *launder* requests there.

SIGN OF THE TIMES—as discovered by Mary Alpanalp of Chula Vista, Calif., who received it from the fine jewelry department of the Broadway Department Store:

Dear Preferred Customer:

You are invited to share with us the excitement of the Loose Diamond and Mounting event.

We don't care *what* they do, as long as they don't do it in front of the horses.

CHANGE OF PACER—as come upon by Paula Deats of Sacramento, Calif., who found it in the *Los Angeles Times*:

Paris (AP) Existentialist author Jean-Paul Sartre told reporters today that he is nearly blind and that his career as a writer is over, but that he plans in the future to direct a number of television programs.

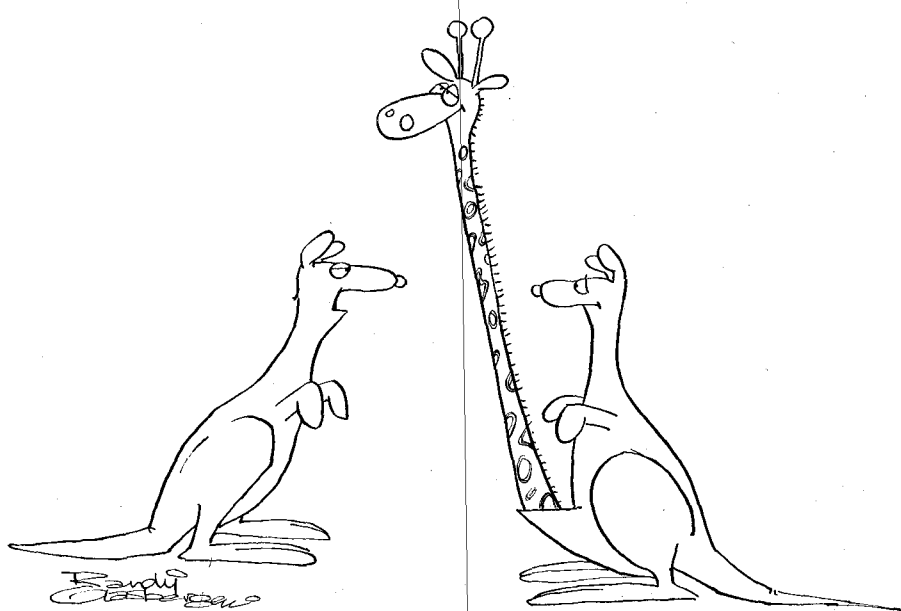
No comment.

THEATRICAL NOTE—as spotted by Henry Staub of Buffalo, from a review of *Two Gentlemen of Verona* in the Buffalo *Courier-Express*:

The play has been updated in costuming to recent time. The place is the seaside. This shift works well on a few levels and is not preposterous, for the characters are young, footloose and lazy. They lie about catching the sun and pruning their bodies.

Don't knock it. It may mean long hair is out. □

Answers to *Booking a Tour With the Bard* (see page 57): (1) *King Henry IV (Part I)*; (2) *Two Gentlemen of Verona*; (3) *King Richard II*; (4) *Hamlet*; (5) *Pericles*; (6) *The Merchant of Venice*; (7) *King John*; (8) *Julius Caesar*; (9) *King Lear*; (10) *Othello*.



*"One of these days we ought to tell him he was adopted."*



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# Double-Crostic No. 79

**by Thomas H. Middleton**

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 G | 2 V | 3 A | | 4 V | 5 K | 6 N | 7 J | 8 E | 9 I | 10 C | | 11 M | 12 A | 13 F | 14 W | | 15 V | | | | | | | | | | | | | | |
| | 16 O | 17 K | 18 Y | 19 U | 20 J | 21 Q | 22 I | | 23 K | 24 Y | 25 F | | 26 R | 27 L | 28 B | 29 O | | | | | | | | | | | | | | | |
| 30 G | 31 U | | 32 D | 33 M | 34 S | 35 P | 36 F | | 37 R | 38 J | 39 H | 40 Q | 41 B | | 42 Y | 43 M | | | | | | | | | | | | | | | |
| 44 H | 45 I | 46 W | | 47 D | 48 Y | | 49 V | 50 J | 51 P | | 52 L | 53 O | 54 Q | 55 N | 56 T | 57 B | | | | | | | | | | | | | | | |
| 58 B | 59 V | 60 J | | 61 X | 62 J | | 63 N | 64 L | 65 U | | 66 Y | 67 I | 68 Q | 69 D | 70 S | 71 O | | | | | | | | | | | | | | | |
| 72 F | 73 H | 74 T | 75 S | 76 B | 77 G | | 78 I | 79 A | | 80 M | 81 P | 82 Q | 83 L | 84 A | 85 B | 86 I | 87 O | | | | | | | | | | | | | | |
| 88 F | 89 N | 90 R | | 91 B | 92 D | 93 R | 94 Y | 95 S | | 96 M | 97 X | | 98 B | 99 V | | 100 R | 101 H | | | | | | | | | | | | | | |
| 102 P | 103 N | 104 Y | 105 J | | 106 X | 107 A | | 108 U | 109 O | 110 I | 111 S | 112 D | | 113 C | 114 Y | | 115 P | | | | | | | | | | | | | | |
| 116 E | 117 Y | 118 J | 119 M | 120 T | 121 I | 122 K | | 123 M | 124 U | 125 F | 126 O | | 127 H | 128 I | 129 X | | 130 O | | | | | | | | | | | | | | |
| 131 E | 132 A | 133 W | 134 H | 135 Q | | 136 Z | 137 H | | 138 K | 139 P | 140 A | | 141 T | 142 P | 143 X | 144 K | 145 Q | | | | | | | | | | | | | | |
| 146 H | 147 C | 148 N | | 149 J | 150 O | 151 A | 152 M | 153 T | 154 X | 155 Q | | 156 U | 157 P | | 158 Z | 159 J | 160 F | | | | | | | | | | | | | | |
| | 161 A | 162 C | 163 R | 164 V | | 165 B | 166 K | 167 Z | | 168 W | 169 H | | 170 R | 171 L | 172 Y | 173 M | | | | | | | | | | | | | | | |
| 174 K | 175 S | 176 M | 177 C | 178 T | | 179 Y | 180 T | | 181 Q | 182 S | 183 W | | 184 A | 185 C | 186 T | | 187 V | | | | | | | | | | | | | | |
| 188 B | 189 N | 190 Z | 191 P | | 192 E | 193 A | 194 X | 195 F | 196 G | | 197 M | 198 K | 199 E | 200 W | 201 H | | 202 H | | | | | | | | | | | | | | |
| 203 I | 204 R | 205 C | 206 O | 207 V | | 208 T | 209 V | 210 S | | 211 S | 212 E | 213 U | 214 I | 215 N | | 216 W | 217 C | | | | | | | | | | | | | | |
| | 218 Y | 219 F | | 220 T | 221 Q | 222 Z | 223 H | | 224 Y | 225 A | 226 E | | 227 Z | | 228 A | 229 G | 230 W | | | | | | | | | | | | | | |

## INSTRUCTIONS

*If you've never solved one of* these puzzles, it will probably look much more difficult than it actually is. If you can answer only a very few of the WORDS correctly, you're on your way to solving the puzzle.

Fill in the numbered blanks of all the WORDS you can guess, and write the letter of each numbered blank in its correspondingly numbered square in the diagram. The letters printed in the upper-right-hand corners of the squares indicate from what WORD a particular square's letter comes.

The diagram, when filled in, should read as a quotation from a published work. The dark squares are the spaces between words. If there is no dark square at the end of a line, a word may carry over to the line below.

*The first letter of each* WORD, reading down, will spell the name of the author and the title of the work from which the quotation is taken.

*You should find yourself see*ing words and phrases taking form in the diagram; so you can work back and forth, from WORDS to diagram and from diagram to WORDS, until the diagram is filled in.

### CLUES

A. Safire book (3 wds.)

B. Meandering

C. Writers given to the use of light sarcasm

D. English satirist (1567–1601; *The Unfortunate Traveler*)

E. Camus novel (2 wds.)

F. Conquer, defeat

G. Lustrous

H. Miller play (3 wds.)

I. Former name of Sabah (2 wds.)

J. Love, devotedness

K. Wonder-worker, magician

L. Co-winner, 1959 Nobel Prize in Physiology and Medicine

M. ____ the Great (c. 132 B.C.–63 B.C.), king of Pontus

### WORDS

228 3 79 107 132 140 151 184 193

225 12 84 161

165 188 28 41 57 98 58 76 85 91

113 147 162 177 185 205 217 10

32 47 69 92 112

116 131 199 226 8 192 212

219 13 25 36 72 88 125 160 195

196 229 1 30 77

134 101 127 169 201 39 44 73 137 146 202 223

9 78 67 86 128 22 45 110 121 203 214

38 50 60 118 149 159 7 20 62 105

138 198 5 166 17 122 144 174 23

27 52 64 83 171

119 152 173 11 80 96 123 176 197 33 43

### CLUES

N. Where Cornwallis surrendered

O. Contrariety

P. Novelty

Q. Repair

R. Perfumes

S. Justify

T. Expatriated, banished

U. "____ great men all remind us" (2 wds.; Longfellow, "A Psalm of Life")

V. Constant

W. Dostoevsky novel (2 wds.)

X. Thinks

Y. Harmonious organization

Z. Name usually given to the Aht Confederacy of Indians

### WORDS

148 189 6 55 63 103 215 89

109 16 29 53 71 87 130 150 206 126

102 142 35 51 139 157 81 115 191

21 40 145 221 82 181 135 68 54 155

93 204 26 100 163 170 37 90

34 70 182 210 75 111 211 175 95

141 186 180 74 208 220 120 153 56 178

213 156 19 65 31 124 108

59 99 187 2 15 207 164 49 209 4

46 168 14 200 183 216 133 230

61 143 129 194 106 154 97

18 94 66 24 117 48 218 104 42

114 179 224 172

167 136 222 158 190 227

Answer to *Double-Crostic No. 78* appears on page 35.



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# Light Refractions

by Thomas H. Middleton

## Puzzles Within Puzzles

Every once in a while, something that appears in a Double-Crostic will elicit an unusual amount of mail. The most recent example, as of this writing, was in the puzzle in the January 11, 1975, issue of *SR*. Let me quote Mrs. Milton S. Harrison of Briarcliff Manor, N.Y., whose letter is typical of many:

"In the Double-Crostic that I finished last night, there was one word which has me completely baffled. . . .

"The definition: 'A neighbor whose house is on fire.' The answer: *Ucalegon*.

"I checked it over and over, and each letter fits correctly into the word of the quotation, which I also checked. It isn't in any of my dictionaries, so I give up. What does it mean? . . ."

*Ucalegon* is right. *Webster's New International*, Second Edition, says: UCALEGON: "In Trojan legend, one of the ancient counselors who sat with Priam on the wall. Aeneas speaks of the flames reaching Ucalegon's house, next to that of Anchises, before he fled from the city. Hence, a next-door neighbor, or a neighbor whose house is on fire."

I must give credit for *Ucalegon* to Jay Thompson, whom I met a few years ago, and who sends me lists of gems he's mined from *WNI II*. Jay Thompson was co-author of *Once Upon a Mattress*, the musical that served as a launching pad for the career of Carol Burnett, and he's a composer and lyricist to boot. I suspect that when Jay curls up with a good book, it's frequently *WNI II*, weighing in at about 15 pounds. That's some curl.

Another type of Double-Crostic entry that can cause trouble is exemplified by a clue that appeared in *The New York Times* Double-Crostic of February 16, 1975. It read: "'. . . 'tis an unweeded garden' (four wds., including one contraction)." The answer, of course, is from Hamlet: "Fie on't! O fie!" I got lots of mail telling me that there's no contraction in "fie on to fie," and that, furthermore, it makes no sense. I should have foreseen that.

A few years ago I pulled a fast one in a Double-Crostic with the clue "Potter's field." I knew I'd get a lot of flak with the answer *Gamesmanship*, but I didn't expect nearly as much as I actually received. "What in the world kind of crazy typographical error is that?" was typical. "My dictionary says a potter's field is a public burial place for paupers. How do you get *Gamesmanship* out of *that*?!!!"

With a surfeit of tunnel vision, I had assumed that the vast majority of Double-Crostics fans would get the point. That assumption rested on two other assumptions, though, one of which is probably correct and the other of which is certainly incorrect. The first, probably correct, assumption was that almost all Double-Crostic fans are reasonably well read; the second, incorrect, assumption was that almost all reasonably well-read people are familiar with Stephen Potter's masterpieces, *Gamesmanship, Lifemanship, and One-upmanship*.

That was not a thinking man's assumption.

Potter's *Gamesmanship* had its enormous popularity about 25 years ago, and while the word *gamesmanship*, defined by Potter as "the art of winning games without actually cheating," has become a part of the language, it's not likely that many people under age 40 would know the name of its originator, much less automatically make the connection between *gamesmanship* and *Potter's field*.

I had a practical demonstration of the author's obscurity recently. I was playing tennis with a man of about 35 —a much better player than I. Early in the set he smashed a blinding first serve directly at me, and, in stumbling to get out of the ball's way, I got the throat of my racket into the path of the ball, which bounced back, skittered crazily along the top of the net, and dropped dead in his court. His jaw fell, and I called out, "I learned tennis from Stephen Potter!"—not a very appropriate remark, I admit.

"I'm sorry?" he said.

"I learned tennis from Stephen Potter!" I repeated.

"I don't know who he is," he said.

"He wrote *Gamesmanship*."

"Oh . . . yes."

Anyway, things like *Fie on't! O fie!, Ucalegon*, and *Potter's field–Gamesmanship* can lead to a situation in which, having solved a puzzle, you're still puzzled.

Sort of a Double-Crostic double-cross. □


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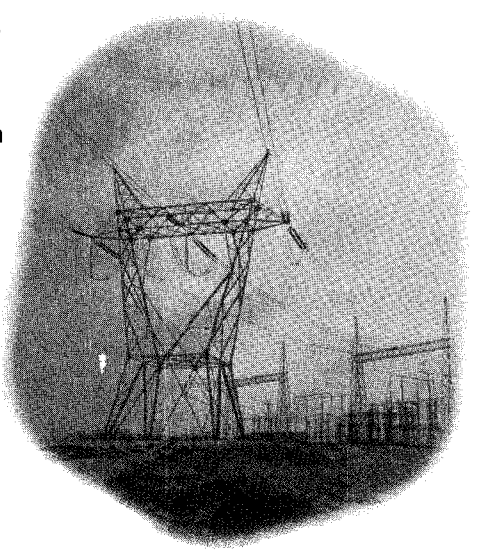

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**1.** Racehorse owner Harry Wilson thought that his cigarette holder put him an extra length ahead in clean taste.

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It works like a cigarette holder works. For good taste.

Kings: 15 mg. "tar," 0.8 mg. nicotine
100's: 17 mg. "tar," 1.0 mg. nicotine
av. per cigarette, FTC Report Apr. '75

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

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